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Mental Health Disorders in DPT Students: Identifying Needs, Support Systems, & Challenges

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Mental Health Disorders in DPT Students: Identifying Needs, Support Systems, & Challenges

By

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Abstract

Background**:** There is an increase in the incidence and severity of mental health disorders in university students. Doctor of Physical Therapy students are at increased risk due to physiological, environmental, and generational factors.

Design: Mixed-Methods, multi-site, descriptive study

Participants**:** Current DPT students (N= 1228) completed a survey and DASS-42; 20 students demonstrating moderate severity on the DASS participated in telephone interviews.

Methods: Surveys were emailed to 238 DPT program directors with a request to forward to students. Following the survey, a total of 20 interviews were completed.

Results**:** DPT students were found to have higher DASS scores than their age-matched peers Depression $t(1227)=10.76$, $p<.005$, Anxiety $t(1227)=7.33$, $p=.005$, Stress $t(1227)=2.91$, $p=.029$. First year students were found to have the highest levels of anxiety ($p=.001$) and stress ($p=.019$) of the 3 groups of students. Several variables were significantly correlated to with higher than average DASS scores which included medication use, history of trauma, use of support services, 3.0 GPA or lower, family history of mental health disease, and a diagnosis or belief of a diagnosis of mental illness ($p\leq.005$). Major themes themes emerged from the data: *1- When Accessing Resources Becomes a Stressor, 2- Seeking Support From Trusted Confidants (sub-themes: Leaning on Familiarity, Leaning on Genuine & Empathic Faculty), 3-Changes in Expectations & Challenges During Professional Education (sub-themes: Growing Up in Grad School,*

The Challenge of Balance, When the Stakes are Higher-Fearing the Fall), Theme 4-Striving For Perfection.

Conclusion**:** This is the largest study to date that examined mental health issues in DPT students. Statistically higher DASS scores were found in DPT students when compared to their age-matched peers, with the greatest concern being on the 1st year graduate students. High DASS scores were also correlated to GPA, gender, medication use, support system utilization, family history of mental illness, history of trauma, and diagnosis of psychological disorder. The magnitude of the transition to graduate school may be contributing to high levels of anxiety and distress.

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Chapter 1- Introduction

Introduction

Psychological distress is a serious issue for college students, as recent studies indicate that between 17% and upwards of 40% of college students report mental health issues related to anxiety and depression.[1,2 3] Although this is a sizable range in incidence, even 17% is concerning when it comes to the negative impact that untreated mental health disease can have on individuals. Despite the growing body of evidence, there is still a substantial lack of solid evidence that has addressed graduate students, and specifically, Doctor of Physical Therapy (DPT) students. Graduate students are a particularly susceptible group of individuals when it comes to mental health disorders. This relates to several stressors, including age, family and personal demands, the elevated expectations of graduate school, and on-going financial burdens.[2] Academic DPT programs and DPT faculty have a unique opportunity to recognize, intervene, and assist these students because of the connection that is established by the student-teacher relationship. However, many faculty do not feel prepared to handle the level of mental health crises in their classrooms today, nor are there clear expectations when it comes to their responsibilities and expectations.[4]

The following chapter discusses mental health in graduate students, specifically physical therapy students and its potential impact on students as individuals and the profession. The overarching goals for the project are outlined, followed by the research questions and hypotheses. Chapter 1 also includes discussion of the significance of the mental health crisis as it relates to physical therapy programs and faculty members.

Lastly, a brief list of terms and definitions for this project is presented.

Problem Statement and Goals

Graduate students are exhibiting an increase in symptoms of mental health disorders in universities across the world, and the stress associated with increased demands and expectations appears to be magnifying the symptoms. [5,6] Eighty-eight percent of university counseling center directors report a continued upward trend of students with severe mental health issues.[6] Students suffering from moderate to high levels of depression and anxiety can experience subsequent decline in academic performance, thereby potentially impacting overall retention and/or attrition.[7] In addition, the presence of mental health issues and their related symptoms can negatively impact the student's physical well-being, interpersonal relationships, and cognitive health.[2]

Graduate students who choose to study within the "hard" sciences, including engineering, medicine, and other health related disciplines, are particularly vulnerable secondary to the intense nature of these programs and the number of high stakes examinations that occur. [8,9] This vulnerability is true of many health science majors, including physical therapy students. To date, there is currently little to no research that has captured the trend of mental health issues in physical therapy students, a profession that has recently elevated its degree from a master to doctorate level. In addition, there are no studies that have examined differences in mental health status between 1st, 2nd, and 3rd year physical therapy students.

In addition to the concern regarding the mental health of graduate students, there are also questions surrounding how to manage students with mental health issues in academic institutions. University faculty and staff are often faced with recognizing and managing the needs of students with mental health issues, and often feel ill-prepared to handle these issues.[4,10] To date there is little consistency in the practices followed by universities and their faculty members. Recent research has demonstrated an established need for faculty to better understand the current trends of mental health in physical therapy students and what is expected of them in response to the increasing prevalence of mental health concerns.[11]

The overall goal of this research project was to identify the incidence of stress, anxiety, and depression in DPT students using a pre-existing and well-established mental health scale. This project also investigated the support systems most readily utilized by DPT students and examined how students perceived the role of their faculty advisors with respect to identifying and managing mental health crises. In addition, this study examined the lived experience of DPT students who are managing mental health issues while in graduate school.

Relevance

Graduate students make up approximately 1.7 million of the U.S. population,[12] and are particularly vulnerable to the risks of psychological distress in both their academic and personal lives. In fact, this group of individuals have a very high percentage of potential self-harm, more so than undergraduates and age matched peers not enrolled in college. It has been reported that graduate students are at a higher risk for

committing suicide than other college students. According to a report by Moffitt et al., The Big 10 Suicide Study found that the highest suicide rates were found in graduate students and those over the age of 25.[13] In fact, for every 100,000 graduate students, 9.1% of women and 11.6% of men committed suicide. Additional studies on graduate suicide rates found that between 10% and 30% of graduate students had contemplated suicide,[14] and at this time, suicide is the 2nd leading cause of death on college campuses.[15] Despite the significance of this data, there is limited research on the specifics of psychological disease in program specific populations.

The lack of research regarding mental health in graduate school is concerning given the extremely high percentages of students reporting high levels of the three most common mental health issues: anxiety, stress, and depression. Depression and anxiety continue to be the most common mental health challenges for both undergraduate and graduate students.[16-18] A study of graduate students found that of 3,100 students, 44.7% reported emotional or stress- related dysfunction, including symptoms of depression and anxiety.[19] Additionally, females consistently report higher levels of depression than males. In fact, in every study reviewed, this was found to be the case.[2,20,21] This is thought to be due to the "role strain" that many women face, particularly when they get to graduate school. The fact that DPT programs consistently represent a higher female to male ratio (approximately 1/3 less males admitted to DPT programs in the year 2017)[22] suggests careful consideration of mental health concerns in the DPT population.

All three disorders-depression, anxiety, and stress produce some common symptomology that negatively impacts a student's overall health and/or cognitive capabilities. In a recent study, depression and anxiety were cited among the most

common psychological factors to impede academic performance.[23] Similarly, it is well known that stress and anxiety negatively impact cognitive abilities and executive function. However, evidence also shows that psychiatric disorders, such as depression adversely impact cognitive function.[24] In fact, students who report depression and/or anxiety also report a significantly lower performance on exams than those who do not.[25]

Optimal executive functioning is essential for students in demanding academic programs, such as physical therapy. Disruption of this ability can often lead to poor academic performance, which continues to be the primary reason for attrition in physical therapy programs in the United States.[26] Attrition rates for first year college students are a staggering 30%-50%,[27] and one study actually reports that well over half of the students who report significant mental illness leave school.[28] This makes psychological well-being of physical therapy students an important factor for universities to consider with regard to retention strategies.

The symptoms associated with stress, anxiety, and depression can also have deleterious effects on a student's overall health. For example, in a sample of 184 college students, a concurrent relationship was found with all 3 of the previously mentioned mental health issues and subsequent physical illness.[29,30] All have also been linked to disruptions in sleep, diet, social relationships, and a propensity for chronic illness.[2] Additionally, a large percentage of students (26.7%) accessing mental health services report feeling the need to use alcohol or drugs to manage their issues.[16] This pattern can feed into an undesirable cycle of both physical and mental distress, both of which do not allow a student to function at a level conducive to optimal success.

To achieve success, graduate students, such as those in the DPT program must overcome increasing pressures. As of 2015, all physical therapy applicants are now required to complete a doctorate prior to sitting for a licensing examination. Students are now faced with 7 or more years of higher education, which means a greater length of time before joining the work force, adding a concomitant increase in the financial strain associated with attaining their degree.

Additionally, because of emerging recognition and acceptance of mental health issues, many more students are entering institutions of higher education with psychological disorders for which they may or not be medicated. According to the 2015 College Student Health Survey, 16.1% of students reported current use of medication for a psychological disorder.[2] A report by the Center for Collegiate Mental Health reported that 36% of students who sought counseling services were medicated for their psychological issues.[16] However, this number likely underrepresents medicated students as it does not capture those who are medicated but do not seek counseling.

In addition, graduate school generally demands a heavier workload than undergraduate programs, and students are expected to be more autonomous during graduate studies. In fact, research suggests that students of health science programs (medicine, nursing, pharmacy, dentistry and allied health) face significantly high levels of stress during the course of training.[31,32] Recent evidence from similar "hard" science programs, shows that it is likely that DPT students also demonstrate a higher level of mental health issues than other graduate programs.[8,9] Of particular concern is the prevalence of depression and anxiety, as these are seen most often in undergraduate and graduate students in the United States. [16] Exacerbation or initiation of either depression

or anxiety is likely to have a significant impact on a student's ability to perform in the classroom or clinic effectively. [9] In addition, this may increase the probability of the student either leaving or being dismissed from the program for academic reasons.

Graduate students often experience additive pressure in the form life stressors, such as family responsibilities. This is seen in graduate students more so than undergraduates, making them exceptionally vulnerable to stress and anxiety.[7] An additional vulnerability is the typical age of graduate students. It is well documented that the most psychiatric disorders are developed between the early teens and mid-twenties,[33] placing the majority of graduate students at the prime age for onset or exacerbation for diseases such as depression. In addition, the greatest number of students who report mental health crises, like depression, are women.[2] This makes a profession such as physical therapy of particular concern since women make up the vast percentage of physical therapists in the workforce. In fact, the trend continues to be approximately 70% female and 30% male, according to the American Physical Therapy Association's 2016 report.[34]

Because educators are engaged with students during such a potentially fragile time, there is a greater onus on faculty to recognize mental health problems and facilitate assistance for these students. Evidence strongly suggests that faculty advisors play a major role in a student's willingness to seek services and affects their overall perception of stress with their academic program.[14,35] In addition, students report their relationship with their advisor as a significant link to satisfaction and retention in their respective program. [30] Despite the evidence, this role may not be actualized or well understood, as there is no formal training required for physical therapists or professors as mentors

outside of academic advisement. Although faculty advisors play a vital role as the primary point of contact, linking graduate students to their respective program, faculty advisors often feel unprepared and fearful when faced with the challenge of a student in crisis.[4] Additionally, faculty and university counselors may not understand the legal and ethical implications related to advising students in the educational setting.[15] While some universities have very clear policies which limit faculty assumptions and actions with respect mental health issues, others may not. In addition, universities may not make their faculty aware of the resources available to the students or to faculty.

For these reasons, it is in the best interest of all DPT programs to understand the incidence and nature of mental health disorders as well as the specific needs and expectations students have of their faculty. This understanding can better equip faculty members to handle the behaviors and needs of students with mental health issues, and assist to facilitate academic success throughout the program. This should ultimately lead to a greater level of retention for students suffering with mental health issues, and, in turn, a stronger group of graduating physical therapists from respected institutions.

In summary, concerns about mental health are growing due to the high percentages of students reporting issues during their professional education. Students report high levels of depression, anxiety, and stress in both undergraduate and graduate literature. Although attrition has been, most typically linked to academic performance, there is strong evidence that suggests psychological morbidity can negatively impact cognitive abilities, thereby impacting a student's ability to perform at a level necessary to achieve success. Because DPT students are a particularly vulnerable population, it is imperative that faculty be aware of the prevalence of existing problems and understand

what is expected of them by in their roles as advisors and mentors. This will allow DPT faculty to develop supportive practices, which may help to improve retention, further develop the student, and strengthen the practice of physical therapy.

Research Questions

There are six research questions pertinent to this problem. They are as follows:

1. What is the incidence of depression, anxiety, and stress in DPT students based on the Depression, Anxiety, & Stress Scale (DASS-42)?
2. Are there significant differences between first, second, and third year DPT students?
3. What demographic and situational characteristics are significantly correlated to depression, anxiety, and stress in DPT students?
4. What support systems do DPT students utilize when experiencing mental health issues?
5. How do DPT students value the support systems that they utilize, and in what ways are they effective in promoting their self-preservation and academic success?
6. What are the perceptions and beliefs of DPT students regarding their faculty advisor's role in responding to and managing mental health issues?

Hypotheses

The following hypotheses were proposed:

1. The proportion of DPT students experiencing moderate to high levels of depression, anxiety, and or stress exceed those of their age-adjusted peers according to current graduate student data.
2. Female students, first year students, and those with previous history of traumatic experiences will demonstrate higher levels of depression, stress and anxiety than other sub-populations of DPT students.
3. DPT students are likely to share beliefs related to a strong desire to feel connected to the faculty advisor and will have some expectations of that advisor with respect to managing mental health issues.

Definition of Terms

1. Anxiety Disorder – This study will use the term "anxiety" to refer to Generalized Anxiety Disorder, which is defined by the DSM-IV-TR as being characterized by at least 6 months of persistent and excessive anxiety and worry.
2. Depression- This study will use the term "depression" to refer to Major Depressive Disorder, which is defined by the DSM-IV-TR as a clinical course that is characterized by one or more major depressive events (period of at least 2 weeks where there is a depressed mood, or loss of interest or pleasure in nearly all activities). This study will use quantifiers for depression based on this definition to describe severity (mild, moderate, and severe).

3. Depression, Anxiety, & Stress Scale (DASS) – defined as a self-report questionnaire that has been validated to measure depression, stress, and anxiety in multiple subgroups of individuals. This instrument offers 2 well-established versions (DASS-21 and DASS-42).
4. Doctorate of Physical Therapy (DPT) Students – those students who are currently enrolled in an accredited program as defined by the American Physical Therapy Association (APTA).
5. Graduate Students – defined as those students who have completed their undergraduate degree and are currently enrolled in a graduate program (Master's Degree or higher).
6. Faculty Advisor- defined as an individual who is designated the role of advising a student with respect to academics, retention, research, and any other pertinent issues that may arise during the course of their graduate studies.
7. Stress – This study will use the term "stress" to refer to Acute Stress Disorder, defined by the DSM-IV-TR as the development of characteristics of anxiety, dissociation, and other symptoms that occur within 1 month after exposure to a traumatic stressor. In this study, the primary traumatic stressor will be considered the workload and demands of graduate school.

Summary

The push to understand and manage mental health disorders has been growing stronger in light of the preponderance of anecdotal and statistical evidence across all age groups. A greater acceptance of psychological disorders is lending itself to a growing

body of research that continues to investigate the current status of various sub-groups and the interventions in place to assist these individuals.

To date, there has been limited research on graduate students, and almost no studies conducted on DPT students. Based on their typical age, common life stressors, and high demands placed on them by doctorate programs, DPT students are at a high risk for developing depression, stress disorder and/or anxiety disorder. These disorders can lead to symptoms that impede a student's ability to learn and be successful in their academic program and in their personal life. Because DPT faculty and administrators play such a vital role in the lives of their students, it is imperative that they understand the incidence of mental health issues in their student body, as well as the resources most sought out for support. In addition, because faculty play such a vital role during a potentially vulnerable time, it is important to understand the expectations students have of faculty with respect to managing these issues.

Chapter 2 – Literature Review

The History of Mental Illness in the United States

The history of mental illness, as a treatable condition, began almost a century ago. Treatment has evolved from the use of insane asylums, insulin shock therapy, and lobotomies to behavioral-cognitive and pharmaceutical therapy. As new knowledge was acquired, governmental funding responded in an effort to maximize quality of life for individuals inflicted with mental conditions. Today, the greatest emphasis is placed on community treatment at a local level, prevention of high risk behaviors, and education of first line reponders.[36]

In 1861, Amherst College became the first university to develop a student health services center, however, it wasn't until 1910 that Princeton established the first student health center to service mental health issues. It took 50 years before this service became the norm on college campuses.[37] Today, all college campuses have services dedicated to assisting students with psychological issues, but with varying approaches. This may be related to improved understanding of students in mental health crisis, as well as the increase in catastrophic events related to mental health such as the Columbine and Virginia Tech shootings. The devastation of such massive and highly publicized events has forced colleges and universities to examine their safety policies as well as their role in mental health management.

The approaches to treatment have evolved significantly over the past 60 years. Early treatment of patients was developed around the theory that individuals with mental health challenges were spiritually or morally weak. The more mild versions of conditions

such as depression and anxiety were considered "psychosocial" rather than neurological and/or physical.[37] In the 1950's and 60's, as funding increased and talk therapy was created to complement new medications, treatment began to transition from hospital to community settings.[37] In response, The Community Centers Health Act (CCHA) of 1963 was passed, which established strict guidelines for in-patient admission of psychiatric patients.[38] This effort at deinstitutionalization helped to encourage individual organizations to provide resources and services to their people, thus influencing a greater emphasis on university-established centers.

Over the past century, several other laws have been passed that have greatly influenced how mental health is managed today. Preceding the CCHA, the National Mental Health Act was passed, which established the well-known, National Institute of Mental Health and allocated research funds to support the growth and development of mental health care in the United states.[38] The Mental Health Study Act of 1955, The Mental Retardation Facilities and Community Health Centers Construction Act of 1963, and the National Alliance for the Mentally Ill of 1979 were also established in efforts to further the financial support and societal awareness and acceptance of these patients.[38] Many of these laws have been repealed or altered with changing administrations; however there is still great emphasis placed on improving the management of mental health across the board.

The current understanding of mental health has evolved from the idea of cognitive fragility to a better acceptance of the physical underpinnings that explain changes in behavior and emotions.[39] Concurrently, the approach to mental health has also evolved, but not just because of the physical evidence for psychological disturbances. Today,

there is a greater emphasis on risk management and proactive interventions that would serve to deter disturbing and/or violent behavior. Within the university setting, the primary role of college counseling centers has evolved to place a much greater emphasis on risk assessment versus symptom treatment.[15] In the years past, when university centers were being developed, counselors primarily sought to assess students who were at risk for suicidal ideation. Although this is still a priority, there is a much greater focus on assessing students who may be at risk for causing harm to others.[36] Due to tragedies, such as the massacre at Virginia Tech, homicidal concerns now overshadow trepidations about self-harm.

In response to calamitous events, such as mass shootings, universities have been forced to examine their policies and procedures in detail. Many changes have been made, particularly since the shooting at Virginia Tech in 2007. Some of these changes tend to be more ubiquitous, including the development of emergency notification systems and the upgrading of security measures. Others are more unique to the institution. These include specific protocols for reporting disturbing behavior and the creation of "care teams" related to mental health responsiveness.[40] But, despite national efforts, many universities and their faculty remain unclear about their obligations, both morally and ethically, when it comes to psychological issues. Although faculty have a duty as mandated reporters if they have concerns about injurious behavior, they are also limited by a student's right to privacy. Although the Family Educational Rights and Privacy Act (FERPA) clearly protects a student's confidentiality, the line between protecting privacy and protecting well-being (of self or others) can be quite indistinct. For these reasons, it remains a priority of higher education institutions to continue to enhance their

understanding of mental health issues within their student body in order to examine, develop, and refine their policies related to such.

Theoretical Framework

The framework for this research is embedded in the diathesis-stress model. This model was originally described in the 1960's by Meehl, Bleuler, and Rosenthal in an attempt to explain the psychopathology of schizophrenia.[41] Today, it is widely accepted as one of the major theoretical frameworks for a variety of psychiatric disorders. The diathesis-stress model, or stress-diathesis model as referred to by some, suggests that a baseline vulnerability or susceptibility to disease must exist for a psychiatric disorder to produce symptoms. This susceptibility is then triggered by an external stressor.[42]

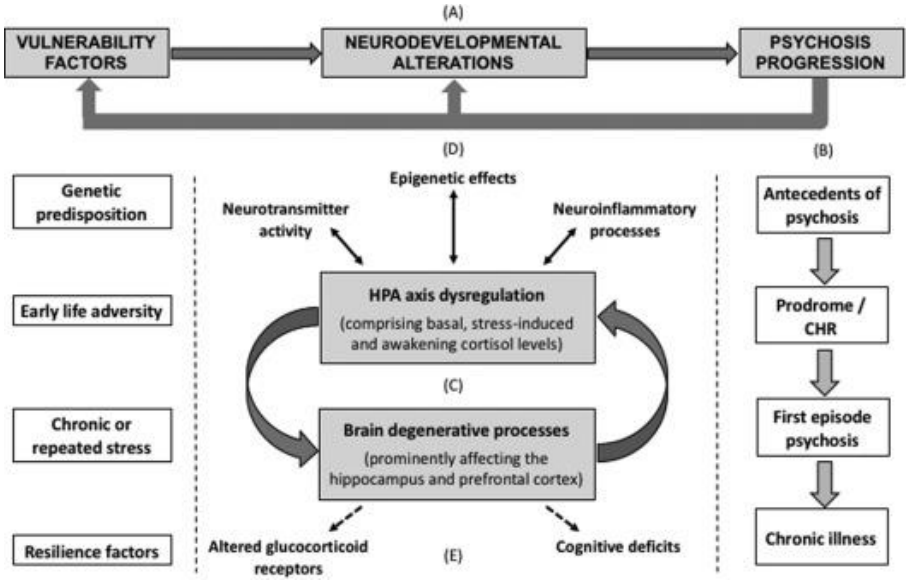
This can be likened to a familiar medical condition, such as heart disease. An individual can have the predisposition for heart disease, such as narrow vessels or genetically elevated cholesterol or hypertension. Through no fault of his own, this individual is at higher risk for developing heart disease than someone else, however it does not necessarily mean that the individual will become symptomatic. The diathesis-stress model comparative would suggest that it will require an external stress trigger, such as a death of a loved one, a stressful job change, or even excessive physical strain to initiate the chain of physiological events that would manifest the disease into symptoms.

It is also assumed that the diathesis, or pre-existing condition, is not static, but rather fluctuates with changes in life events and time.[42] This can help to explain why some individuals may have a new and sudden onset of symptoms when they have no such history. Their diathesis, once not at high susceptibility, now becomes acutely sensitive

following changes in hormones, anatomy, or biology; making it open to reactivity from a trigger or stress that may not have impacted them before. On the other hand, this theory also helps to explain why individuals who have demonstrated episodes of mental dysfunction in the past may experience an increase in the frequency and intensity of symptoms with less stressors. This is called the Kindling Model/Effect, which essentially suggests that as susceptibility increases, the stressors required to trigger symptoms decrease.[42] Figure 1 highlights the factors that influence vulnerability and also the biological and neurological changes that can occur with the deregulation of neurotransmitters and their subsequent effect on inflammation. This further emphasizes the neurochemical influence on cognitive function, which impacts higher level thinking and problem solving.[43]

Figure 1. Stress-Diathesis Model

M. Pruessner et al. / Neuroscience and Biobehavioral Reviews 73 (2017) 191–218



There is a large body of evidence that supports this theory in a variety of disorders. For example, Jones and Fernyhough discussed their findings in a 2007 report, where they found significant evidence to support diathesis-stress explanations for patients with schizophrenia.[44] A more recent study by Chang et al. found a positive interaction between life stress events and risk for depression. Chang's study included 611 university students, averaging approximately 21 years of age. He assessed correlation by using 4 major scales (Hope Scale, Trauma History Questionnaire, Center for Epidemiologic Studies Depression Scale (CES-D) and the Beck Anxiety Inventory (BAI). He found that students with low hope experienced depressive symptoms. Students with low hope who also experienced trauma were found to have the highest correlation to depressive and anxiety symptoms. Their overall evaluation of findings suggested that stressful life events could dull the impact of hope and create a greater susceptibility for depression, anxiety, and even suicide in students.[45]

The correlative link between trauma (life stress) and depression is supportive of the diathesis-stress model in that it demonstrates the possibility of psychological disease progression through the catalyst of stress. Chang's research is important in understanding the connection between the prevalence and incidence of mental health in college students, and why this population is particularly vulnerable.

Researchers have also found connections between diathesis-stress and pain perception following trauma. Consistent with previously discussed literature, Turk found a positive correlation between how patients responded to the trigger of injury and pain, with a set of predisposing factors. In his paper, Turk examined the impact of several diatheses (anxiety sensitivity, fear avoidance, catastrophizing and self-efficacy) on

chronic pain, and created a model of explanation for the variation in pain response by individuals. [46] Again, Turk's hypotheses align with Chang's research and support the notion that physiological and psychological responses can be triggered by external stress given certain predispositions. This also helps to explain the variation in responses and mental health illness among individuals who experience the same stressors.

According to a 2015 survey, students reported the highest stressors as death or illness of a loved one, roommate/housing conflicts, financial strain, and interpersonal relationships.[2] These factors may play a significant role in the triggering of a mental health crisis for students, particularly graduate students. For health science and medical students, the very nature of these highly competitive programs, and the high stakes methods of assessment can be significant triggers for mental health crisis. Medical students report triggers as sleep deprivation, external performance pressure, financial strain, and exposure to the reality of death and suffering.[9,47] These stressors are common among, not only medical students, but also nursing and allied health students.

Pulido-Martos et al.[47] assessed several quantitative studies for common sources of stress among nursing students. Although these studies were not easily comparable in methods or sample size, common themes emerged: academic stress, such as workload and study requirements, performance pressure, and fears if inadequacy, related to clinical work.[48] Similar to medical and nursing students, psychology graduate students also reported similar stressors, including sleep issues, financial concerns, worries about patient suffering, and fear of performance.[49]

Doctor of physical therapy students also report similar triggers. Jacob et al. examined three DPT programs by which they assessed sources of stress using the Undergraduate Sources of Stress Scale (USSS).[5] Academic pressure was found to be the greatest source of stress for DPT students, while the next most significant factor was that of financial strain.[5] This same scale was utilized in another DPT study by Walsh et al. where they only assessed a single university but, again, found academic stress to be the greatest, with financial and personal stressors following.[50] These factors can be assumed to be consistent with DPT programs on a national level, however, international students may experience different stressors. There is some literature on international programs citing concerns arising from infrastructure decline, political influences, and other culturally driven issues.[51] These types of concerns do not appear in the literature associated with U.S. programs.

The diathesis-stress theory leans heavily on predisposition and stressful triggers. There is no way to know what types of predilections students bring with them when they enter college, but we do know that college introduces a number of stressors that may impact a biologically, psychologically-vulnerable student. Understanding the specific stressors experienced by DPT students and understanding the potential for manifestation of psychological issues may help administrators and faculty manage critical student situations.

Incidence and Prevalence of Mental Health Disorders throughout College

Anxiety and depression have been and continue to be the most commonly reported mental health disorders reported on college campuses today. According to the

2015 College Student Health Survey (CSHS), 26.3% of students seeking counseling reported anxiety and 26.2% reported depression over their lifetime, and these rates have continued to increase slightly over the past 6 years.[2] According to the same report, just over 33% of those students had given serious contemplation to suicide and over 9% had actually made the attempt.[2] These high percentages only reflect students seeking assistance. This does not capture those students who are either unwilling or unable to access services.

According to the most recent National College Health Survey (NCHS), anxiety and depression were reported most frequently among all college students, with anxiety reported at 16.7% and depression at 13.1%.[21] In addition, the NCHS found that almost 6% of surveyed students had seriously considered suicide in the past 12 months.[21] These rates are especially concerning because issues such as generalized anxiety disorder (GAD) have shown significantly "high rates of comorbidity with other psychiatric problems, especially for college students."[15] Another smaller scale survey found similar rates, but striated their data. Eisenberg et al. reported that 15.6% of undergraduate and 13% of graduate students reported depression or anxiety via a web-based survey using the Patient Health Questionnaire.[20] These rates have pushed universities to re-examine their policies and procedures with respect to mental health and their students.

Because of changes in approach and perception, there has been a call for research aimed at better understanding how institutions can assist high risk individuals such as college students.[7,10,17,30,47] Much of the research is outdated, but studies over the past 20 years have primarily focused on mental health of international students, undergraduates, and use of support services. There is currently a very small body of literature that

focuses on specific groups of students within specific disciplines, but this is very limited. The preponderance of evidence exists in the fields of nursing and medicine, but does lend itself to speculation of similarities in related fields.

There is a significant lack of research in the profession of physical therapy which seeks to describe or explain the status of mental health in this specific group of students. However, there is clear evidence which supports an increase in both the actual and perceived intensity, severity, and incidence of mental health issues among the almost 3 million graduate students[52] enrolled in universities today. [2,10,53] Almost 90% of college counselors report an increase in the number of students they are seeing, as well as an increase in the severity of symptoms and diagnoses of mental health disorders. [6] In a study by Hyun et al., 45% of graduate students reported "significant emotional distress" over the past year.[19] In a much larger study, the Center for Collegiate Mental Health reported that the number of students seeking mental health assistance in over 140 university counseling centers had risen by approximately 81% between 2010 and 2016. [16] Per these most recent statistics, the growing concern cannot be ignored, particularly by individual programs that are on the front lines for recognizing symptoms and assisting these students.

Mental Health in Health Profession Students: Medical Education Literature

Specific health science and medical programs are beginning to recognize the growing prevalence, both statistically and anecdotally. In several studies, medical students consistently demonstrate higher levels of anxiety and stress than their age-matched peers.[9] Slonim et al.'s findings supported these results as well. Though the

study's primary goal was to assess the correlation between self-care, mindfulness, and distress, this study found that medical students demonstrated higher levels of depression and anxiety than their age-matched peers. The researchers used a web-based survey design to collect their data, which was distributed via email. And, like our current study, Slonim et al. chose the Depression, Anxiety and Stress Scale (DASS-21) as the survey tool to determine levels of mental distress.[54]

International studies of medical students have also reported high levels of depression and anxiety using the DASS-21. Saravanan and Wilks found 34.9% of students had some level of depression and 44% reported anxiety.[55] This study was limited by the fact that it was completed in a single university setting and utilized a paper survey, which required completion at the introduction of the study. This may have created response bias as well as a sense of coercion that may have been minimized by utilizing a private, email survey. Overall, this was a strong study in that it utilized well-established tools and had a fairly large sample (n=358) for a single institution.

Coinciding with much of the previous work, Ghodasara et al.'s research surveyed medical students at Vanderbilt University. Unlike the previous studies, the research team chose to use several survey tools, which they admitted may have led to recall bias and reporting errors. Their tools included the Eating Disorder Examination Questionnaire (EDE-Q), the Beck Depression Inventory (BDI), the State Trait Anxiety Inventory (STAI), the Michigan Alcoholism Screening Test (MAST), and the Drug Abuse Screening Test (DAST). Their goal was to examine a wide range of mental health disorders, which exceeded the efforts of most of the reviewed literature on the topic. Their study found that almost 25% of their medical students were at least mildly

depressed and anxiety levels were high with 46% of women and 25% of men reporting significant rates.[56]

The literature on medical students demonstrates use of a wide variety of mental health scales. A 2006 systematic review of depression and anxiety of U.S. and Canadian medical students found the most common survey tools to be the BDI, and the Center for Epidemiological Studies Depression Scale (CES-D), as well as the Symptom Anxiety Checklist Scale for Anxiety (STAI).[47] There were several others cited, but the authors did not note use of the DASS in the medical literature. It's possible that many of these studies assessed a single construct of mental health (i.e. stress or anxiety) as opposed to looking at more than one. Some researchers may have felt that an overlap of constructs would have created difficulty in interpreting the results, but the evidence on the DASS has shown that depression, anxiety, and stress are distinguished reliably. [57]

One international study assessed mental health of undergraduate students using the DASS-42 in order to establish prevalence and to compare this data with other programs using the same tool. Despite the fact that these were undergrads, a large number of them were medical or science majors (42.1%). Like other studies, the levels of depression, stress, and anxiety in their population of students were higher than the normative values. However, in contrast with most other studies, Bayram and Bilgel found that students studying political and social science reported higher levels of depression and anxiety than those studying science or medicine.[18] This may be cultural in nature or may be correlated more closely to the age and level of the student since the academic consequences of undergraduate performance are typically less than that of graduate students. Despite the inconsistency of their findings as compared to U.S.

students, this study demonstrates usefulness of the DASS in the university setting and high incidences of depression and anxiety across medical, social, and political science majors.

Mental Health in Health Profession Students: Nursing Education Literature

Several studies assessed varying constructs of mental health in nursing students. One study reported over half (62%) of associate degree nursing students as having a self-reported mental illness using an uncommon scale called Keyes Mental Health Continuum. [11] Since this study examined associate degree students and a less reliable tool than many of the other mental health scales, it is not readily comparable to the graduate population. However, their findings support a high rate of mental health challenges in health science students.

International nursing studies also show a high prevalence of mental health issues. In some studies, no less than half of the sample studied reported mental health concerns. Papazisis et al. found that 52% of nursing students reported high levels of psychological morbidity to include depression.[58] For this study, 3 separate tools were used to measure mental distress, including the General Health Questionnaire (GHQ), the State Trait Anxiety Inventory (STAI), and the Beck Depression Inventory (BDI). The greatest limitation of this study was the small sample size (n=170).

A recent study by Cheung et al. discovered similar trends in a larger group of Hong Kong nursing students (n=661) when using the DASS-21. In this study, nursing students reported high levels of depression, anxiety, and stress (35.8%, 37.3%, and 41.1% respectively). They also studied correlates to each construct and found significant

relationships between several factors and mental health issues. These included sleep issues, financial strain, year in program, and family crises. [59] This report did not include academics as a major source of stress, which is heavily cited in much of the nursing literature. This is of interest to future researchers since academic strain has been noted as a primary trigger in several pieces of literature. In a systematic review of nursing studies, the most common source of stress was found to be academics such as workload, study concerns, and others.[48]

Mental Health in Health Profession Students: Other Health Related Professions Literature

Several other health science professions have also begun studying mental health in their students. In one study, students enrolled in graduate psychology programs across the United States and Canada demonstrated higher levels of mental distress than the general population.[47] In another study by Birks et al., psychology, nursing, dental, and medical students were compared.[59] In this study, the common theme of high stress levels was reported using the Perceived Stress Scale (PSS) in all groups, however, dental students were found to present with the highest levels of stress.[60] This study utilized paper surveys, which may have contributed to a limited response rate. Although not directly reported, the authors admitted to a significant decline in sample size over the course of the study.

Ford et al. found that almost 70% of graduate pharmacy students reported high levels of perceived stress. This study utilized the PSS through a web-based survey of 306 students, which yielded a 60% response rate. Not only did they note a significantly high level of stress, but also identified academic workload, social support, and extracurricular

activities as triggers for stress by using a linear regression model.[8] Ford also examined the effect of academic year in the program on stress, which showed that second year students had higher levels than first year students. This is contrary to some of the other literature that has demonstrated more concern with first year students. However, the larger body of evidence has examined primarily undergraduates, and therefore, there is not significant evidence for adequate comparison of year in program.

Dental students have also shown high levels of depression and anxiety. Farrelly et al.[60] found that dental students had significantly higher DASS scores (for anxiety and depression) than those of professional dentist and undergraduate students. Stress, however, was not found to be significantly different between dental and undergraduate students.[61] Yet dental students have been found to exhibit higher stress levels than medical students in another small study by Birks et al.[59] In the Birks et al. study, the PSS was used to measure stress between dental, medical, and nursing undergraduates, as well as graduate mental health students. Return rate and sample size were limitations of this study, but it does contribute to some questions about which health science programs may have the highest incidence of mental health concerns.

Studies such as Farrelly's and Cheung's help to highlight the usefulness of examining the 3 constructs of depression, anxiety, and stress at one time, as the researchers were able to glean a tremendous amount of information from administering one survey. These studies may have been limited by the fact that they were paper surveys and low sample size, impacting the generalizability of the study. However, it does not detract from the reaffirmations regarding the concerns about health science students and mental illness.

Mental Health in Health Profession Students: Physical Therapy Literature

Although the literature in the profession of physical therapy is sparse with respect to mental illness, there have been a few studies attempting to address this concern. Macauley & Plummer's study examined Doctor of Physical Therapy (DPT) students. They reported significantly high levels of anxiety in both 1st and 2nd year students using the State Trait Anxiety Inventory (STAI).[17] In their study, the STAI mean scores were comparable to those of army recruits, thus higher than their age-adjusted peers. This data indicates that graduate students, particularly health professions majors, have high levels of anxiety that can lead to significant mental health concerns, however the results of this study would have been stronger if they were more generalizable to the entire DPT student population in the U.S.

The Journal of Physical Therapy Education (JOPTE) published 2 studies directly related to physical therapy education and mental health. The first study by Frazer & Ecthernach,[62] assessed the causes of academic stress and ways to mitigate the effects on student performance. The authors utilized 3 separate stress assessments for students in 2 universities. They found the most significant stressor to be academic issues of workload, study habits etc. The second JOPTE study, completed by O'meara et al.[63] aimed to assess perceived stress between different groups of physical therapy students by using the Academic Stress Scale and the Health Index. Neither of these scales were found in any of the health science literature from the last 10 years, making this difficult to compare to contemporary studies. However, the authors did find that physical therapy students were significantly more stressed than non-physical therapy students, again confirming that health science students may be at higher risk for mental health related issues.

In addition to the above U.S. data, a study of 3 international DPT programs found similar trends as those sited previously.[5] High levels of perceived stress were seen in each individual program using the well-established PSS. They found perceived stress levels to be equivalent to or higher than their U.S. peers, however the primary focus of this study was to determine sources of stress as they correlated to stress levels.

A recent study by Jocob et al.[64] found that academics were the most significant source of stress for students, followed by personal and financial factors. In addition, the Jacob study was designed to assess academic achievement along with perceived stress and perceived difficulty. Using the PSS and the Scale for Assessing Academic Stress (SAAS), they found that although the PSS wasn't significantly correlated to academic performance, the SAAS was. Twenty-one percent of 1st year students reported high levels of perceived stress as it relates to academics specifically,[64] suggesting the need for faculty awareness with first year cohorts. Although recent, this study is still not readily generalizable to the DPT population within the United States secondary to the fact that all participants were international students and not doctoral level, nor does it assess the depth of mental health issues that are of rising concern.

Walsh et al.[50] found that out of 127 undergraduate physical therapy students, 27% scored above the threshold for high psychological morbidity using the General Health Questionnaire (GHQ). Similar to Jacob's study, academics were found to be the most significant cause of stress.[50] This level of psychological morbidity is slightly lower than other literature, which reports anywhere between 22%-48% for medical students. However, there may be some discrepancy among sample sizes as medical student cohorts tend to be larger than physical therapy student cohorts. A limitation of this study was in

the use of the GHQ, as it has a positive predictive value of only 54%, meaning that it has a high chance of incorrectly identifying mental health issues when they are, in fact, not present.[50] The authors did attempt to off-set this limitation by utilizing a second survey tool, the Undergraduate Sources of Stress Questionnaire (USSQ), but this was not able to rule out the presence of this issue.

The GHQ was also used in a study by Omigbodun et al.[50] where the authors compared psychological distress across 4 groups of Nigerian students (medical, dental, nursing, and physical therapy).[50] This was a single-institution study, with a return rate of 53%. This study found that medical and dental students had significantly higher GHQ scores than physical therapy and nursing students. However, the sample of medical and dental students was significantly higher than that of the nursing and physical therapy students (963:155), creating a definite bias in the results.

Finally, a 2016 study by Judd et al. assessed stress levels during simulation and clinical education, finding high physiological levels of stress during both, but more significantly during simulation testing.[65] This study was unlike any of the others noted in the literature in that stress was measured in terms of the physiological responses of heart rate, cortisol levels, and the subjective report of stress using the Visual Analogue Scale (VAS). Heart rate and VAS were both significantly elevated during both didactic (simulation) and clinical encounters, however they were more elevated during simulation than during actual patient interaction. Cortisol was not significantly elevated in either. Again, these findings indicate high stress levels during the didactic portion of the program, but also emphasize the level of stress that physical therapy students perceive during all of their educational requirements.

All of the aforementioned research reinforces anecdotal concerns expressed by university faculty and staff, but no studies have examined incidence of the 3 the largest mental health concerns for comparison: stress, anxiety, and depression. In addition, no research has assessed DPT students in a large-scale, multi-university investigation. An older study assessed prevalence of stress and found that physical therapy students were significantly more stressed than non-physical therapy students, [63] but this was limited to a single geographical region and was not large scale. In addition, physical therapy students were only required to complete a baccalaureate degree at that time, making the new challenges of doctoral preparation not readily comparable. Overall, the literature appears to strongly support the propensity for high levels of mental health issues among medical and DPT students, but lacks the evidence on a large sample size to make the findings generalizable to all DPT programs across the country.

Attrition & Mental Health

Attrition has been widely studied amongst college students in the United States. Not only does attrition impact the university, program accreditation, and the individual, but there are also far reaching financial consequences for students and their families. Although information regarding graduate student attrition rates is more difficult attain, there is some evidence revealing rates between 30% and 50% for first year undergraduate students.[27] Studies for doctoral students show attrition rates as high as 70%,[66] however there is very little data on professional doctoral students or graduate students in general. One study of health science graduate students examined attrition rates over 7 years. Their findings showed an attrition rate of 52% for under-represented minority students in the health science programs.[67] No studies were found that assessed attrition rates as a

general graduate population. However, a study cited by Andrews et al. suggests the attrition rate of physical therapy students to be approximately 5%.[26] This percentage was based on a 1997 study, and secondary to the significant changes to DPT programs and expectations since that time, this is likely no longer accurate.

Traditionally, attrition has been explained primarily by academic standards of graduate record examination (GRE) scores and previous grade point averages (GPA's). Research in the area of physical therapy program admissions relies heavily on these factors, and studies have found that most students fail to matriculate because of academic reasons.[26] In a study conducted by Jewell et al., verbal GRE (VGRE), quantitative GRE (QGRE), and GPA were all found to be significant predictors of academic probation of physical therapy students.[68] Utzman and Jewell followed up on that study by using the data to formulate a prediction rule using the same variables.[69]

In order to meet CAPTE (Commission on Accreditation in Physical Therapy Education) requirements, each DPT program must demonstrate a graduation rate of 80%.[70] This percentage is impacted by students who fail to matriculate because of academic or disciplinary reasons, but does not account for those who leave for physical or mental health concerns. It is possible that these are not CAPTE considerations based on the fact that the data has not supported the need for attention in this area prior to recent studies. It is also possible that this type of data is difficult to compile based on privacy and stigma concerns. Nonetheless, the most current research clearly demonstrates an increase in the prevalence of mental health disorders, which has the potential to negatively impact academics and therefore, program completion.[23] Consequences such as being placed on probationary status or loss of accreditation may result if a program

suffers from consistently low graduation rates. This is one of the many reasons that DPT programs must carefully examine the causes of attrition. They must also work to create admission processes that ensure admittance of students who are capable of being successful in this type of academic environment.

Kessler et al.estimated that mental health disorders were responsible for approximately 5% of college students' attrition.[71] Based on the preponderance of evidence that demonstrates significant increases in the incidence and severity of psychological disorders in college students, it is likely that this number is much higher. According to the National Alliance on Mental Health, 64% of college students with mental health issues claim that the reason for withdrawing was due to their psychological disease.[72] It is also likely that many students who withdraw for academic reasons may have an underlying mental health condition that they have not disclosed. There is also no evidence, that programs have a system for capturing this kind of data, further increasing the likelihood that the percentage is much higher than 5%. This is a significant concern for admissions committees, as they must begin to consider these issues as they potentially impact student success and retention.

Recent research suggests that the reasons some students fail to complete their programs may be linked to unresolved mental health issues. Andrews et al. found that college students who reported depression and anxiety had lower exam scores than those who did not.[25] A similar study on medical students conducted a year later found a significant correlation between perceived stress and performance.[9] Likewise, nursing students who had higher levels of academic difficulty were associated with reports of

mental health issues.[11] To date, there are no studies in physical therapy that have assessed the relationship between mental health status and academic performance.

Nursing, pharmacology, medicine, and dentistry have all begun to address the link between psychological morbidity and academic decline. These findings and subsequent assumptions are largely supported in the literature. For example, neurocognitive research has shown that disorders such as depression, anxiety, and stress impact the anterior portions of the brain including the frontal lobes and frontolymbic areas. These areas control function such as working memory, learned memory, processing speed, and attention.[24] Difficulty with these executive functions certainly impact one's academic capabilities and performance, potentially leading to failure or withdraw from a program. Early research showed that academic impairment was seen in 92% of students who were found to have depression, and the more significant the depression, the greater impact on academics was seen.[73] This data lends itself to the legitimacy of the potentially serious impact that mental health disorders can have on a student's ability to be successful in the academic setting.

Resource Utilization by Students with Mental Health Disorders

Students may seek many different resources for support when they are experiencing difficulty during their tenure in their professional program. These resources include family, friends, outside counseling/psychiatric services, institutional counseling services, faculty members and administrators.[14] However, use of mental health resources is significantly underutilized, particularly in the academic environment. A review of literature by Hunt and Eisenberg found that 24% of college students with depression and

less than 20% of students with anxiety sought treatment.[3] In a study of medical students, it was found that only 22% of those with moderate to severe depressive symptoms sought treatment.[74] These trends are concerning as delay in treatment has been shown to cause prolonged recovery time and increased frequency of episodes.[3]

What are the barriers that may prevent a student from accessing the appropriate care? The literature identifies several obstacles, including lack of time, financial issues, and stigmas around mental health.[3,14,15] The most common barriers were found to be lack of insurance coverage, lack of knowledge of available resources, lack of perceived need, and skepticism about the usefulness of psychological or mental health therapy.[3] In addition, students report concerns about medications and ways to handle them. In a qualitative assessment of student needs, Megivern et al. found that many students felt uncertain about how to manage the side effects of the psychiatric medications as related to their academic demands.[75] This can create a challenge with medication compliance and therefore may limit a student's progress towards recovery and academic achievement.

The challenge is confounded by an increase in the severity and frequency of cases that create a strain on institutional responses to students. Ninety percent of counseling centers have reported an increase in both the seriousness and incidence of psychological illness. This same survey found that 46% of counseling services have a waiting list.[6] College mental health counselors report excessive caseloads, limitations in their scope of practice necessitating outside referrals, and being forced to reduce or limit the number of sessions for students.[76] These reports are troubling and have forced colleges and universities to re-evaluate the accessibility of mental health care.

Some institutions may actually be at higher risk for seeing greater numbers of mental illness than others. Evidence from a 6-year study by Lipson et al. found that higher levels of psychological co-morbidity including depression, anxiety, and suicidal ideation using the Patient Health Questionnaire correlated most strongly to institutions who had the following characteristics: public, doctoral-granting, large enrollment numbers, lack of residential housing, less competitive rankings, and low graduation rates. In addition, doctoral-granting institutions were also found to have the lowest resource utilization rate of mental health services - 37%, compared to 46% at those offering only baccalaureate degrees.[77] This data would suggest that physical therapy programs are at greater risk for problems and attrition related to mental health disorders, emphasizing an on-going responsibility for individual programs to develop policies and procedures for identifying and addressing these needs.

There is very limited empirical evidence on the impact of institutional interventions, although, there are some emerging studies that are incorporating innovative ways to manage the barriers to mental health care. These strategies include the use of Therapist Assisted -Internet Based – Cognitive Behavioral Therapy and continuous screenings with tools such as the Behavioral Health Measure.[76,78] Universities have also begun developing threat management and behavioral risk committees. These groups provide faculty and administration with additional resources for handling concerning behavior. Campuses are also working to merge their student health and behavioral health services to improve coordination of care, and to allow students who are concerned about stigmas to reach out to non-mental health providers if need be. Despite the variations among institutions, they all share the desire and necessity to re-evaluate and

accommodate to the changing needs of their students. In order to do this effectively, more research is needed to understand what resources students are accessing and what their expectations are with respect to behavioral health.

Role of Faculty and Perceptions of Mental Health Disorders

University faculty members, including professors, clinical faculty, and administrators, play a significant role in the way students perceive their academic experience. There is a significant amount of research that acknowledges the impact of the faculty-student relationship on academic performance. In a review of literature conducted by Barbara Christe, several studies were found to show a significant correlation between a positive student-faculty relationship and academic performance in Science, Technology, Engineering, & Math (STEM) disciplines.[79] In addition, college students may be more likely to persist through their program if they feel a connection to their faculty members. Nursing students who perceive a high level of support from faculty are more likely to demonstrate persistence throughout their academic program than those who perceive support as low.[80]

The quality of faculty-student relationships and frequency of interactions have been shown to have a significant impact on a number of factors such as student identity and altruism. As one of the core values of physical therapy practice, altruism and related principles have been identified by Alexander Astin as being impacted by a students' college experience.[81] His work, which has involved extensive assessment of the factors which influence students in higher education, demonstrates the positive impact of faculty-student interaction on the development of empathetic behavior, such as selfless regard for

others.[81] Astin also describes the faculty-student relationship to positively influence a student's self-perception of their personal and cognitive development.[81]

It has also been suggested that the informal communication between student and mentor may play a role in retention. Lamport's meta-analysis reported a 1976 study by Pascarella and Terenzini that found students who reported low levels of faculty interaction had a 27% drop out rate as compared to 9% of students who reported high frequencies of faculty interactions.[81] This data suggests that the connection between faculty and students helps to establish a sense of belonging and acceptance, which according to O'Keeffe, is a "critical factor in determining retention."[82] It is not certain, however, whether such a relationship can be critical in supporting students with mental health issues to obtain the necessary support.

As leaders and mentors in a student's chosen profession, the relationship between faculty and students may offer opportunities to recognize symptoms or behaviors consistent with a psychological disorder. A faculty member may be someone whom the student trusts and may confide in, therefore, not surprisingly, there appears to be a connection between mental health and the faculty-student relationship. In Han's study of international students, statistically significant high levels of depression and anxiety were correlated with having a poor relationship with one's advisor.[30] This is further complicated by the fact that some studies actually show that students report receiving primarily negative reactions when they disclose their psychological disability to their instructors.[83] Thus, faculty may be unaware of the impact their response has on students, and it may also highlight the need for a deeper understanding of the role of faculty in dealing with mental health issues.

Understanding these concepts is especially important for health science educators, as they may be considered the best source of information and the first line of defense.[84] Leino & Kisch reported that health educators were found to be the most believable resources for students with mental health issues.[84] A separate study also found that healthcare educators actually perceive themselves as more prepared to handle mental health issues than those without a medical background.[53] These findings would suggest that faculty members in the health professions are, at least somewhat equipped for these challenges and trusted by those who need assistance the most.

The research on faculty perceptions of their role and desire to be supportive to students is overwhelmingly positive. In one study, 91% of all instructors felt that they played a valuable and significant role in managing students with psychological disorders or distress.[53] Faculty members generally felt a sense of obligation and desire to assist students in need. However, there is some fear and perceived lack of preparedness to do so in many cases. In one study, less than half of all faculty members felt that they could differentiate between a mental health disorder and a student who was benignly upset, but 84% were open to new resources and motivated to learn tools for responsiveness.[83] All available research suggests that the desire to do better exists, but the current knowledge base and means to provide support have yet to be cultivated.

The roles and expectations of faculty may not be clearly understood by all stakeholders. In addition, the current research on faculty-student relationships is largely limited to undergraduate students, with the exception of some studies found on doctoral students in dissertation phase. This is not readily comparable to DPT students in that dissertation work is extremely autonomous in nature, and the length of the process varies

widely from student to student. The lack of research in the world of graduate studies emphasizes the need for further exploration into the very significant impact that faculty relationships may have on a student who is experiencing psychological issues.

Mental Health Scales

As has been evident in this review of the literature, there are several widely-recognized mental health scales that are applicable to the college student. Few, however, examine three separate constructs of mental health while maintaining their integrity to differentiate between each construct. The following paragraphs will discuss the most commonly used scales for depression, anxiety, and stress, as well as their applicability to the current sample and comparison to the DASS. They will be examined in 4 sub-categories; Depression, Anxiety, Stress, and Mixed.

Depression Scales

By and far, the most commonly cited depression scale is Beck's Depression Inventory (BDI). This scale is a self-report measure that assesses severity of depression, and correlates with clinical findings of depression at $r > 0.60$.[85] Internal consistency of the BDI is high, cited at 0.86 for psychiatric patients, and just slightly less for non-psychiatric patients.[86] This scale has demonstrated validity and reliability in several populations over time and has been in use since the early 90's. It is useful because it can be utilized across many different populations and can also be used to assess *change* in symptoms over time. This scale is used in much of the psychological research, but was seen less in the health sciences literature as it related to college students. This may have been related to the fact that many of those studies included an aspect of anxiety or stress,

which the BDI does not capture. In addition, all versions of the BDI are not available for public use and require both permission and a fee for use.

Another very common scale is the Center for Epidemiological Studies Depression Scale (CES-D). This scale was specifically developed to screen for symptoms of depression in community samples. Unlike the BDI, which aims to assess severity of depressive symptomology, the CES-D aims to screen for core components of depressive behavior or feelings. The benefits are similar to the BDI in that it is widely utilized and recognized in the literature, and it is a self-rating scale, simplifying the administration and time required to complete. A recent study found high internal consistency among non-institutionalized adults,[87] and it has been validated in several populations, including Hispanic college students in a study completed the same year.[88] The CES-D is available for public use at no cost to the researcher or clinician.

Another commonly-used scale is the Patient Health Questionnaire (PHQ-9). This is a brief self-rating scale that, like the BDI is able to assess severity of depression, although its use is described as a screening tool. The PHQ-9 has been used in several countries and for a variety of populations as well, however it is limited by the fact that it does not fully encompass all aspects of depressive disorders as well as other scales.[85] This may be one of the reasons that it is used primarily in non-psychiatric settings. The literature has varying reports of sensitivity of the PHQ-9 to major depressive disorder, however it has been reported as high as 88%.[85] Specificity of the PHQ-9 appears to be consistently high in most studies, reported at 88% as well.[85,89] This scale is free for download and use without permission or fees.

Anxiety Scales

The anxiety scale found commonly in the literature is the Generalized Anxiety Disorder Scale (GAD-7), indicating it's brief, 7-item structure. This scale is used to screen for anxiety disorder, which is general in nature (not differentiating the sub-types; social anxiety, panic disorder, obsessive compulsive disorder, and PTSD). This self-report scale asks questions with an assumption of anxiety and aims to measure the amount of impact this has on one's daily routine. Originally developed for use in primary care, this scale has since been validated for use in the general population, with equally high reliability.[90] At this time, this scale has not been shown to detect change over time effectively, however is used often as a quick screen for suspected anxiety disorders. Secondary to its simplicity, it does not necessarily require a trained rater, making it useful in non-clinical settings. It is also available for public use and requires no permission for reproduction or distribution in the public domain.

Another scale is the State-Trait Anxiety Inventory (STAI). The STAI is a very commonly cited scale in both national and international research. It is not meant as a screening tool, but rather used to differentiate between state anxiety, that which is acute in nature, specific to current situations; and trait anxiety, that which is chronic and unrelenting in nature, not specifically related to a particular event or circumstance.[85] It is also helpful in differentiating anxiety disorder from other depressive syndromes. Psychometric data was difficult to find on this scale, most studies referencing back to the original author, Spielberger, who demonstrated high internal consistency >.89 and strong correlations with other widely recognized scales.[85] However, Kvall et al. examined the scale in a group of geriatric patients and found high specificity and sensitivity of 0.88 and

0.87 respectively, concluding that it was useful in the detection of several mental health disorders in this population.[91] Overall, this scale is respected in the literature, but current data on psychometric properties is lacking. In addition, this is a private scale and requires permission and fees for use.

Lastly, the Hamilton Rating Scale for Anxiety (HAM-A), created in 1959, was developed to measure severity of perceived anxiety, and is considered a "benchmark" scale for the development and validation of several other scales. Unlike the STAI and the GAD-7, this is a clinician report scale, making its use slightly more challenging, although it has been utilized as self-report in some literature. Inter-rater reliability is an obvious concern with this scale, but most of the literature has found this to be adequate.[92] In addition, it's test-re-test reliability is cited at a value of 0.96, making this a useful tool in assessing change over a 1 week period of time.[85] Advantages to the HAM-A include the length and usability with a variety of samples. In addition, it is published for public use at no cost to the researcher or clinician.

Stress Scales

By and far, the most commonly cited stress scale is the Perceived Stress Scale (PSS). This scale was developed by Cohen to assess the level at which an individual perceives unpredictable life events as stressful over the past 4 months.[91] There are 3 versions of this test varying in item number (4, 10, and 14). This scale has been heavily relied upon to demonstrate stress in the college/university population. The scale has been found to be valid and reliable in this population and correlates highly with the STAI.[93] Internal consistency is high with a Chronbach's alpha of >.70 in most studies. Test re-

test reliability has been tested less often and therefore, was found to be satisfactory in the few studies that offered this statistic.[94] The PSS is in the public domain for usage and requires written permission for use in publication.

In contrast, the General Self-Efficacy Scale (GSE) is used to measure belief in one's ability to overcome a stressful event or circumstances. This scale has been used widely with patients with chronic disability, such as Parkinson's disease and spinal cord injury. Although most cited in chronic disease samples, a 2002 study assessed the universality of the scale over 25 countries to include the United States. This study confirmed both the reliability and validity of this scale over a multi-cultural sample of individuals aged 15 to 67.[95] In addition, internal consistency has been shown to be acceptable at 0.86-0.88.[96] This scale is available for public use at no cost.

Mixed Scales

Since depression, anxiety, and stress are all substantial components of the current mental health issues most cited for college students, a scale that could perform a multi-assessment, yet differentiate the constructs, would be useful. In addition, offering more than one survey for busy college students may decrease the likelihood that they would initiate or complete the survey. In an effort to fully maximize return rate, as well as gather a valuable amount of data, mixed scales have many advantages. The following section will highlight three mixed scales including their usefulness and any limitations.

The 28-Item General Health Questionnaire (GHQ-28) has several variations, including 12, 28, 30, and 60 item versions. It is intended to measure minor, generic psychological morbidity, and is cited by some studies as a screening tool for non-

psychotic patients. Specifically, it is able to assess for depression, anxiety, and other psychotic disorders. There is some conflicting evidence to support the use of this tool with some sub-populations in the literature. A study by Hankins highlighted the low positive predictive value of this scale, meaning that a measurement error exists that may inappropriately identify individuals as having a psychiatric disorder when they, in fact, do not.[97] However, good internal consistency has been demonstrated over a span of research, and has been found to be reliable and valid, particularly with psychological morbidity and the diagnosis of depression.[98] It has also been validated on a large multi-cultural front, with a focus on assessment among young adults.[99] The GHQ is a private, copyrighted scale that requires request for permission prior to use.

The second mixed scale is the Kessler Psychological Distress Scale (K-10).[98] There is also a 6 item version of this scale available. This scale's greatest asset is the ability to discriminate between actual mental health cases and non-cases of community samples by assessing symptoms of anxiety and depression over the past 30 days. The generalizability and strong psychometric attributes of this scale have made it attractive to major organizations such as the World Health Organization.[100] Most of the research has shown strong validity and reliability in many populations with high levels of internal consistency. However, there is some question about its use with young adults secondary to issues with measurement variance across genders.[101] Overall, this scale is not heavily utilized in the mental health literature as it relates to universities, however it appears to be readily accepted for use in the general population. It is unclear as to whether or not public use of this scale is allowed. Researchers and clinicians must follow professional protocol of requesting permission prior to use.

The Depression, Anxiety, and Stress Scale (DASS-42) is a scale developed in the 1990's by Lovibond and Lovibond in an effort to capture evidence of depression, anxiety, and stress as separate, yet related constructs of negative mental health status.[102] The full version is comprised of 42 self-report questions, each which are linked to 2 of the 3 sub-scales. Scores are interpreted by adding answers from questions related to each scale and assessing the total against a severity rating, which ranges from normal to extremely severe. A 21-item version also exits with very strong psychometric properties, and a 14 version scale was recently assessed in an effort to further establish the constructs as separate and valid.[57]

The DASS, in its original form, has been found to have strong validity with other measures of depression and anxiety and high reliability, particularly with populations in the western hemisphere. The scale has been utilized and validated in a number of national and international studies involving university students,[103-106] making this a good choice of tools for this study of graduate DPT students. The shortened version, the DASS-21 demonstrates a very slightly lower reliability than the 42-question version, however remains very high and suitable for clinical research.[107,108] Statistically, the DASS was found to have greater convergent validity than other like scales. In addition, the internal consistency was found to be extremely high, with an alpha of 0.897 for anxiety, 0.947 for depression, and 0.933 for stress.[102]

The DASS is the most appropriate tool to be used for DPT students based on its psychometric properties, ease of use, and applicability to this population. The 42-item version was chosen over the 21 item version in order to maximize the reliability of the answers. The longer version takes approximately 10-15 minutes to complete, which

should still minimize the fatigue factor and encourage completion. This scale was chosen because it is able to discriminate between 3 of the most commonly cited mental health disorders among college students, providing a more detailed picture of the scope of the psychological morbidity present in today's DPT students. In addition, the scale is available for public use and is easily attainable. It is widely utilized and easily recognizable, making it the best choice for comparison to other studies in the fields of medicine and allied health. Ultimately, the DASS-42 was chosen for its versatility, strong psychometric properties, and ease of use.

Summary

The approaches in mental health care have changed drastically over the past 60 years, and we are now seeing a need across college campuses greater than ever before. Although anecdotally substantiated, the increased prevalence and incidence in psychiatric dysfunction among DPT students has yet to be assessed on a large scale, across multiple regions. Evidence to support this population as a high risk group is apparent in their age, the subsequent stressors associated with graduate education, and lack of utilization of available resources.

The fragility of this population is further explained by the stress-diathesis model, which clearly describes the propensity for a surge in mental health disorders during the college years. In an effort to better describe the current state of psychiatric health in DPT students, this research focused on the incidence of anxiety, depression, and stress as the most commonly cited concerns for college students. Despite several mental health scale options, this study chose to utilize the DASS-42 to maximize the amount of data gleaned

from a single survey. Understanding prevalence of depression, anxiety and stress may impact faculty's ability to respond to behavior changes and academic decline. This is supported by the neurocognitive evidence that clearly demonstrates the impact of these disorders on higher level thinking tasks, making DPT students with mental health disorders at higher risk for attrition.

In addition to needing a comprehensive understanding of the current climate, there is also a need for faculty members to understand what support systems are available to and chosen by students, as well as their role in managing students with psychiatric or behavioral needs. Most faculty members have the desire to assist and feel a sense of responsibility to the student, but many do not feel prepared to do so. The secondary aim of this research project was to more clearly define the supportive resources and the role of faculty members in order to lay the groundwork for intervention as a first line of defense in the university setting.

Chapter 3- Methodology

Introduction

Chapter 3 describes the research methods utilized for this project regarding both data collection and data analysis. The mixed methods design included an electronic survey distributed to all accredited DPT programs nation-wide followed by a qualitative assessment of the experiences of DPT students living with psychological disorders while matriculating in their graduate program.

Research Methods

In the mixed-methods design, the quantitative portion investigated the prevalence of mental health disorders among DPT students across the nation using the Depression, Anxiety, and Stress Scale (DASS-42) with a larger sample size than previously cited in the literature. The qualitative portion delved into the participant's utilization of support services, barriers and facilitators to accessing resources, and the lived experience of DPT students.

The quantitative portion of the project answered the following research questions:

1) What is the current incidence of depression, anxiety, and stress in DPT students based on the Depression, Anxiety, & Stress Scale (DASS-42)?

2) Are there significant differences in DASS scores between first, second, and third year DPT students?

3) What demographic and situational characteristics are significantly related to depression, anxiety, and stress in DPT students?

Two self-report surveys were utilized to answer these questions. The first survey incorporated a basic demographics & history survey (see Appendix A) created to include gender, age, year in program, ethnicity, geographical region of the United States, and undergraduate GPA. In addition, the survey included mental health history questions including use of mental health medications, history of mental health services, history of trauma, and presence of chronic disease. These data points were in correlation with data from several large survey studies that have assessed mental health disorders in college students.[2,16,21]

The second quantitative assessment was in the form of a well-established mental health screening tool, The Depression, Anxiety, and Stress Scale (DASS) located in Appendix B. This scale is comprised of 3 subscales meant to measure each of the constructs and to differentiate them from one another. It essentially functions to provide clarification as to the source of changes in behavior and emotions and provide a focal point for intervention. This scale is differentiated from several other self-report scales in that it includes stress syndrome, which is a highly prevalent phenomenon is the college population. It is very simple to use and functions as a basic Likert scale with 0 meaning "does not apply to me at all," and 4 meaning "applies to me very much or most of the time." In addition, it is particularly useful at capturing an individual's current state, as it is assessing feelings over the past week. A full discussion of the psychometric properties of this scale was included in Chapter 2.

In order to maintain HIPPA and FERPA requirements, the program Psychdata was utilized for both the demographic survey as well as the DASS-42 questions. This program provides the questions to all participants in an electronic format and records the

responses to a private portal, which requires single user log-in access. Through Texas Woman's University, Psychdata is widely utilized by faculty and recognized as a useful tool for capturing quantitative survey data. It maintains complete confidentiality for all participants, ensuring that no identifying information is present. In addition, full consent was included, and voluntary completion of the survey was recognized as full consent. For this portion of the study, the only time a participant was identified was through self-disclosure. Participants were asked to volunteer for the interview portion of the study by indicating so on the bottom of the survey. In addition, they were asked to provide an email address for future contact. The email contact was completely voluntary and was not required to complete the survey.

In an effort to maximize generalizability and gather sufficient data for analysis, this survey was sent to all DPT programs in the United States. There is currently a total of 238 DPT programs which are accredited by the Commission on Accreditation of Physical Therapy Education (CAPTE). An attempt was made to reach out to each program and request participation via email contact with either the Director of Clinical Education (DCE) or the Director of each program. An overall return rate for these surveys was not possible to calculate secondary to the in ability to see which universities chose to participate and how many students each university had available. Current data and expectations for survey designs suggests a return rate of 50%-60%.[109] However, a power analysis was run to determine the approximate number of responses required for maximal power of .90.

Apriori Power Analysis

Prior to data collection, an apriori power analysis was conducted in order to determine the approximate number of survey respondents needed to find a significant result (if it exists) when comparing level of student (ex/ year 1 and year 3). The original power analysis for this 1x3 one-way independent ANOVA was set for six pairwise comparisons or .05/3 or .0167 with a small estimated effect size of .2. At a power set at .90, N=per group of 677 was calculated or 2,031 for 3 years of students. However, after 790 responses were collected, a preliminary data analysis revealed larger than expected effect sizes for the anxiety and stress comparisons. For depression, the Cohen's d was 6.68-5.67/7.08 or .142, which was lower than expected. In this case, it would take approximately 5,000 participants to achieve a power of .95. However, for anxiety, the Cohen's d was 7.29-5.31/6.15 or .322. With this effect size the power for the analysis was .88 with 250 participants in each group. With the addition of 10 participants per group, the power would be .90. For stress, the Cohen's d was 13.78-11.92/8.7 or .214 and a power of .48 with 250 participants in each group. With approximately 585 participants per group, the power would be .90.

Another key comparison was to look for difference in average depression, anxiety, and stress scores as compared to students. For these three comparisons, the alpha level was set at .05/3 or .0167. With an estimated effect size of .2 and a power of .90, a total sample of 341 was estimated.

Finally, comparisons between participants with a history of potential mental health influences, such as history of trauma, would be compared to participants without.

For these three comparisons (with history of trauma as the variable), the alpha level was set at .05/3 or .0167. With an estimated effect size of .3 and a power of .90, a total sample of 153 was estimated.

Next, an apriori power analysis was run to determine the approximate number of participants needed to find a significant relationship between DASS-42 scores and demographic variables using a Pearson correlation coefficient. Power was assumed to be (.90) with an estimated r=.30. Assuming a significance level of ($\alpha = .05$), the number of responses was 112.

Survey Data Collection

All surveys were followed by weekly reminder emails for a total of 3 weeks. Email contact was made with the current directors of DPT programs across the country requesting assistance in the email distribution of the survey email to their students. This served to protect the privacy of the students by maintaining personal contact information to their program chairs unless otherwise offered to the researcher.

At the end of the survey, students were asked if they are willing to participate in a brief follow up interview via telephone. If they answered yes, they were prompted to provide an email address for future contact. In addition, there was full disclosure of request to audio tape, and a separate consent form was used to obtain permission for the interview. There were a large number of participants willing to complete the interview portion (approximately 75). From that sample of individuals, 20 names were randomly selected and contacted to participate in the qualitative, interview portion of the study.

Quantitative Data Analysis

Demographic information including age, gender, ethnicity, year in the DPT Program, and history of mental health issues were described as frequencies and percentages. Total scores on the DASS-42 for depression, anxiety, and stress were also calculated. Depending on the type of data (nominal versus interval) and homogeneity of the data, parametric and nonparametric correlations were performed to determine if there were significant relationships between the demographic variables and the DASS. Between group comparisons were calculated using ANOVA and t-tests depending on the variable type.

Qualitative Data Collection

The qualitative portion of the study aimed to explore DPT students' ideas regarding their choice in support systems, the perceived value of their resources, and their perception of faculty open to supporting them when they were having difficulty. Although the guide (See Appendix D) directed the interview process, interviews developed naturally to provide a broad perception of their experiences.

Students volunteered to be selected for interviews following the on-line survey. Students who self-identified as moderately impaired in at least 2 out of the 3 categories based on their DASS scores and provided an email address were then stratified by geographical region. Each of the 4 geographical region categories were randomized. Students were selected in the order that they were randomized to and were asked if they were interested in completing the interview via the email that they provided during the survey. This method continued until 20 telephone interviews were completed and data

saturation was achieved. Three interviews were scheduled but not completed as a result of the participant not answering the phone at the scheduled time. In each case, the next individual on the randomized list was chosen and an interview was requested.

All interviews began with a scripted description of the interviewer, the study, notice of confidentiality, and the advisement to ask questions or refrain from answering if they chose. Prior to the telephone call, all volunteers consented to the interview via the online survey and disclosure of their email contacts. In addition, all participants verbally agreed to continue with the interview prior to semi-structured questioning. Each interview lasted between 25 and 45 minutes, depending on the depth of information the participant was willing to share. All interviews were recorded with the verbal permission of the participants prior to discussion. Permission to record was established on the informed consent as well as via verbal acknowledgment prior to the interview. Throughout the entirety of each interview, participants were probed about their overall experience as a DPT student with previously disclosed mental health issues.

Upon completion, the interviews were transcribed by 3 graduate students in the PhD in Physical Therapy program from Texas Woman's University (TWU). Transcribers were recruited through the PhD program at TWU via email. Funding was provided by the College of Health Sciences to compensate the transcribers for their time. All three students signed confidentiality forms prior to transcription. The audio files were uploaded by the primary investigator to a private google drive, which was accessible only by the primary researcher and the transcriber. All word documents were then uploaded to Nvivo for coding, which is a password protected program. All interviewees were identified using a number/letter combination designated by the primary

researcher. No names, institutions, or otherwise identifying information were used during the interviews. In two cases, the interviewee offered their geographic location, but otherwise, no other identifiers were included in the transcripts.

At the end of the interview, each individual was sent a $20 gift card, which was provided via grant award through a Texas Woman's University Small Grant (See Appendix C). The students' answers were recorded and transcribed by 3 TWU graduate students over the period of 8 weeks. The data was uploaded to Nvivo, a secure program that allows data to be uploaded and then organized according to themes as indicated by the researcher.

Qualitative Data Analysis

The data was then examined through contemplative synthesis of meanings that emerged, revealing commonalities about the true essence of the experience and perception of the mental health experience of students. The researcher did share some transcribed information with the dissertation committee only for confirmation of quality analysis. As the primary expert on the panel, Dr. Bini Litwin served as the qualitative expert to ensure rigor in the development of themes.

Coding and theme generation were completed by the primary investigator and substantiated by a second qualitative expert reviewer. Saturation was noted after approximately the 12th interview, however all 20 interviews were completed to ensure rigor. Although there were no new codes established after the 12th interview, some interview data was coded more than once as the information was being organized. The coding process was an iterative one in which all interviews were read and summarized in

the notes section by the primary investigator. Once coding began, reflexive journaling was utilized to take note of emerging themes, recognize and remove any personal biases, and adjust codes as necessary. All interviewees were given pseudonyms by the primary investigator to protect confidentiality. The data was analyzed using the constant comparison method,[110] which ultimately resulted in 4 major themes and 5 sub-themes. The themes were verified and confirmed by the primary researcher and the dissertation committee to ensure rigor throughout the coding and theme generation process.

This qualitative method has been validated by several recent mental health studies.[1,4,111] Deasy et al. completed a mixed method design which is similar to the current study. In their research, university students enrolled in nursing and teaching programs were studied secondary to the high levels of assumed psychological stress experienced by individuals enrolled in heavily practicum-based programs, similar to DPT students. They utilized an objective measure (including the GHQ) to assess psychological status and followed this up with a qualitative interview component, aimed at further developing the coping mechanisms and resources utilized by these students. Their interview process was flexible but had structured questions to maintain the focus of the conversation.[1] The investigators in this study found value in utilizing the qualitative data to explain and support their quantitative findings.

To fully assess the qualitative questions around perceptions and resource utilization from a phenomenological framework, inductive analysis and creative synthesis were utilized as a strategy. This allowed the primary researcher to gather the details from each participant, cross reference them with quantitative data and previous research, and then present findings in terms of patterns and common themes. The use of triangulation

method (as noted by using more than one confirming source) was useful in adding validity to the quantitative findings. In addition, all interviews were completed by the primary researcher and audio taped to allow proper analysis of the data. A Sony, digital voice recorder with USB properties was utilized to record the interviews.

The data was then uploaded to a secure google drive file and saved on an external drive, which was locked in the office of the primary researcher at Texas Woman's University, Houston TX. Once data assessment is complete, all interview data will be destroyed via digital wiping of the external drive. The interviews were not shared or heard by anyone other than the research team, which included transcribers. In addition, the hard copy of the recordings were stored in the same faculty office as all other data.

In addition, all identifiable contact information remained locked in a faculty office, room 7137, at 6700 Fannin Street, Houston, TX 77030, making the information only accessible to the primary researcher. Although the other 3 members of the research team had access to the data collected during the interviews, they did not receive any identifying information about the participant in reviewing the data.

Development of Interview Questions

Interview questions (Appendix D) were developed using several central questions followed by a group of sub-questions. The central questions were meant to be very broad, open-ended discussion questions that guided the interviewer to the next line of questioning. The central research questions were as follows:

1. What support systems and/or resources do DPT students rely upon when experiencing mental health issues?

2. What are the perceptions and beliefs of DPT students regarding their faculty advisor's role in responding to and managing mental health issues?

Small Grant Proposal

A small, internal grant application (Texas Woman's University Small Grants Program) was submitted in support of this project for the amount of $460.00. The grant was awarded in the full amount (See Appendix C) and these funds were utilized to purchase the DASS Manual ($60.00) as well as to provide incentive gift cards (20 cards x $20 .00 = $400.00) for participation in the telephone interview.

Reliability and Validity

For the quantitative portion of the study, reliability and validity are both strong components based on the scale being used and the method of distribution. Therefore, the reliability depends largely on the questionnaire. The DASS-42 is a well- established scale that has been used in a number of studies across several groups of people, of many nationalities, and is well established in the age group being assessed in this research. It has been found to have high reliability and validity. Specifically, it demonstrates strong convergent validity with other widely recognized scales that measure depression and anxiety.[108] In addition, the DASS demonstrates high construct validity and is often chosen for use secondary to its ability to differentiate between the all 3 constructs under the umbrella of a single scale.[112] The study included a large sample of 238 DPT programs possible from all geographical regions of the United States, making the results more generalizable.

The overarching goal of the qualitative portion of the study was to glean depth into the findings of the quantitative portion, and to provide information relative to faculty and their role in mental health as perceived by their students. Because this portion of the study was meant to complement the larger, more robust quantitative component, the sample was smaller and more focused. The qualitative portion of the study is considered reliable and valid secondary to the customary and accepted method of data retrieval as well as the design structure.[113] Reliability was maximized by the nature of a single interviewer, therefore the sequence of questions, the prompts and tone remained similar for all participants. Bias of the interviewer was minimized by careful development of a semi-structured interview outline, which streamlined the flow of questions.

In addition, content analysis had the oversight of an expert panel of 3 research committee members. In order to improve consistency of the interview process, questions were focused to decrease fatigue for participants as well. Careful attention was paid to the tone and response interest of the participant to gauge quality of responses. Since quality qualitative research is largely dependent upon rigor in data analysis, the use of thematic review was utilized by having a qualitative expert, other than the researcher, review the data for consistency. In addition, although qualitative research cannot be considered "generalizable," an attempt was made to include respondents from various areas of the country to add depth and perspective to the data.

Summary

In summary, this study is a mixed methods design with the primary goal of establishing an understanding of the current state of mental health in DPT students. In

order to deepen the value and understanding of the role that supportive resources, (including faculty members) play in the lives of these students, the study incorporated a qualitative portion aimed at investigating student perceptions of this construct. The study utilized a pre-existing mental health scale and a semi-structured interview process to gather data for analysis. In addition, a small grant application was sought and awarded in order to support this project. While recognizing the inherent limitations of survey and qualitative design, all attempts were made to minimize these limitations and maximize the validity and reliability of the study.

Chapter 4: Results

Quantitative Data

Descriptive Statistics

Data collection concluded in September of 2018. All data was downloaded from the Psychdata program into Excel 2016, where it was renamed, labeled, and coded. In addition, the data was cleaned to represent only those participants who completed the DASS-42 scale as well as questions 8-16 on the survey. These questions were specific to mental health experience, family history, personal trauma, medication usage, and resource utilization. It was important that these variables were complete in order to determine appropriate correlation between the DASS subscales and personal experiences.

The total sample size before removal of incomplete data was N= 1,273. One participant selected the "do not wish to participate option," and was removed. Thirty-four participants did not complete the DASS-42. All of these participants omitted questions 32-42. It is likely that this was due to the fact that participants did not realize they needed to click "next" in order to complete the final page of the survey. All 34 were removed. A total of 1,238 surveys remained with complete DASS-42 data. All were included in the specific DASS data calculations.

A small number of participants did not complete questions 8-16 of the demographic survey. A total of 1,228 had complete demographic and mental health history data. All were included in the study. Of the total sample, 285 (23%) were male and 941 (77%) were female, with the majority of students falling between the ages of 20-30 years (93%) (Table 1). One respondent indicated age below 19, and therefore, the

category was changed to 19-25. The majority of students (991or 81%) reported their ethnicity as white. Hispanic and Latino ethnicities were the next most prevalent at 85 students (7%), followed by Asian with 74 students (6%).

Table 1.Age, Gender, and Ethnicity & DASS Scores

Personal Demographics		Construct	N	Mean	Standard Deviation	Min	Max
Age	Age 19-25	Depression	941	6.13	7.38	0	41
		Anxiety	941	6.25	6.16	0	36
		Stress	941	12.41	8.59	0	41
	Age 26-30	Depression	198	7.50	8.22	0	42
		Anxiety	198	6.69	6.93	0	34
		Stress	198	13.73	9.65	0	40
	Age 31-40	Depression	76	8.00	8.75	0	41
		Anxiety	76	6.16	5.89	0	25
		Stress	76	13.78	9.21	0	42
	Age 41 +	Depression	12	7.92	9.43	0	30
		Anxiety	12	6.92	8.28	0	31
		Stress	12	14.08	10.54	0	39
Gender	Male	Depression	285	6.52	8.24	0	41
		Anxiety	285	5.17	6.27	0	36
		Stress	285	10.82	8.38	0	38
	Female	Depression	941	6.45	7.45	0	42

		Anxiety	941	6.64	6.25	0	34
		Stress	941	13.26	8.88	0	42
Race/Ethnicity	Alaskan Native	Depression	2	4.50	4.95	1	8
		Anxiety	2	.50	.71	0	1
		Stress	2	8.5	.72	8	9
	Hispanic/ Latino	Depression	84	6.51	7.80	0	36
		Anxiety	84	6.49	6.86	0	36
		Stress	84	11.76	8.32	0	35
	Asian	Depression	74	8.30	1.02	0	36
		Anxiety	74	6.95	5.94	0	27
		Stress	74	12.77	8.51	0	34
	AA/Black	Depression	32	6.78	9.09	0	33
		Anxiety	32	5.44	7.69	0	34
		Stress	32	11.13	9.46	0	38
	Hawaiian/ Pacific Islander	Depression	4	8.75	5.68	1	13
		Anxiety	4	10.75	10.21	2	25
		Stress	4	17.25	10.44	2	24
	White (not Hispanic)	Depression	991	6.29	7.43	0	42
		Anxiety	991	6.22	6.19	0	34
		Stress	991	12.72	8.84	0	42
	Other	Depression	38	7.05	9.15	0	39
		Anxiety	38	7.34	6.24	0	24
N = 1238		Stress	38	14.71	9.66	0	33

The sample was relatively evenly distributed throughout the United States with 403 (33%) from the Northeast, 377 (31%) from the Southeast, 114 (10%) from the Southwest, and 320 (26%) from the Southwest (Table 2). In addition, current year in school was also evenly distributed with 363 (30%) first year, 464 (38%) second year, and 372 (30%) third year students. A total of 28 (2%) of students reported that they had been in the program for 4 years or longer. High GPA values were reported for the majority of students with 878 (71%) reporting a 3.5 or higher and 26 (2%) reporting a GPA below a 3.0 (Table 2).

Table 2. Region and GPA Data with DASS Scores

Student Demographics		Construct	N	Mean	Standard Deviation	Min	Max
Geographic Region	Northeast (NE)	Depression	403	6.92	7.97	0	42
		Anxiety	403	6.66	6.32	0	31
		Stress	403	13.34	8.80	0	41
	Southeast (SE)	Depression	377	5.68	6.80	0	37
		Anxiety	377	5.73	6.23	0	34
		Stress	377	11.97	8.75	0	42
	Northwest (NW)	Depression	112	6.05	7.23	0	35
		Anxiety	112	5.60	5.16	0	20
		Stress	112	12.18	7.83	0	33
	Southwest (SW)	Depression	320	7.10	8.30	0	41
		Anxiety	320	6.79	6.66	0	36
		Stress	320	13.18	9.25	0	38

Year in DPT Program	1st Year	Depression	363	6.98	7.68	0	41
		Anxiety	363	7.18	6.50	0	32
		Stress	363	13.98	9.05	0	42
	2nd Year	Depression	464	6.58	8.15	0	42
		Anxiety	464	6.37	6.51	0	36
		Stress	464	12.31	8.79	0	40
	3rd Year	Depression	372	5.81	6.95	0	34
		Anxiety	372	5.49	5.79	0	31
		Stress	372	12.06	8.67	0	41
	More than 3 Years	Depression	28	7.00	7.06	0	28
		Anxiety	28	5.14	4.72	0	20
		Stress	28	11.14	7.33	0	24
Current Grade Point Average (GPA)	3.5 – 4.0	Depression	878	5.61	6.88	0	41
		Anxiety	878	5.82	6.00	0	34
		Stress	878	11.96	8.57	0	42
	3.0 – 3.4	Depression	323	8.51	9.03	0	42
		Anxiety	323	7.50	6.86	0	36
		Stress	323	14.53	9.22	0	40
	Below 3.0	Depression	26	10.58	7.80	0	28
		Anxiety	26	8.46	6.18	0	20
		Stress	26	15.89	9.00	3	33

N=1238

Mental Health Statistics

Mental health history was captured in the survey. When asked if students had a family history of mental illness, 505 (41%) responded "yes" and 597 (49%) responded "no," with 125 (10%) admitting to not knowing if it was present. Of those who responded "yes," the most common descriptions were depression (201, 16%), Other (176, 14%), and Anxiety (132, 11%) (Table 3). There were some limitations as to how this answer was reported based on the structure of the question. The answers allowed for a single choice only, and therefore, some participants opted to choose "other" because there was more than one mental health disorder to report. This was noted from the fill-in answers that followed. Therefore, the values of the most common descriptions are likely under-reported in this data.

Table 3. Mental Health Variables and DASS Scores

Mental Health Variables		Construct	N	Mean	SD	Min	Max
Medication Use	Currently Take Medication (YES)	Depression	183	10.35	9.40	0	42
		Anxiety	183	9.97	7.51	0	36
		Stress	183	16.95	9.04	0	41
	Currently Take Medication (NO)	Depression	1045				
		Anxiety	1045	5.68	5.82	0	34
		Stress	1045	11.97	8.59	0	42

Family History of Mental Health Disorder(s)	Family History (YES)	Depression	506	7.81	7.96	0	42
		Anxiety	506	7.52	6.89	0	36
		Stress	506	14.68	9.00	0	40
	Family History (NO)	Depression	597	5.10	6.84	0	37
		Anxiety	597	4.95	5.45	0	32
		Stress	597	10.71	8.42	0	42
History of Trauma	Trauma (YES)	Depression	387	8.78	8.71	0	42
		Anxiety	387	7.92	6.77	0	36
		Stress	387	15.04	9.10	0	42
	Trauma (NO)	Depression	841	5.42	6.85	0	41
		Anxiety	841	5.58	5.92	0	34
		Stress	841	11.64	8.51	0	41
Chronic Disease	Chronic Disease (YES)	Depression	115	7.70	7.64	0	42
		Anxiety	115	8.02	6.59	0	28
		Stress	115	14.23	8.75	0	39
	Chronic Disease (No)	Depression	1113	6.35	7.64	0	41
		Anxiety	1113	6.14	6.23	0	36
		Stress	1113	12.58	8.84	0	42
History of Drug or Alcohol Abuse	Drugs or Alcohol (YES)	Depression	100	7.71	8.58	0	41
		Anxiety	100	6.89	6.50	0	31
		Stress	100	14.10	8.92	0	39
	Drugs or Alcohol	Depression	1128	6.37	7.55	0	42
		Anxiety	1128	6.27	6.27	0	36

	(NO)	Stress	1128	12.59	8.82	0	42
Accessed Formal Health Services	Accessed Services (YES)	Depression	341	9.49	8.95	0	42
		Anxiety	341	8.67	7.30	0	36
		Stress	341	15.96	9.20	0	40
	Accessed Services (NO)	Depression	887	5.32	6.74	0	38
		Anxiety	887	5.41	5.60	0	34
		Stress	887	11.47	8.37	0	42
Diagnosed with a Mental Health Disorder	Diagnosed (YES)	Depression	716	8.19	8.79	0	42
		Anxiety	716	7.88	6.96	0	36
		Stress	716	15.10	9.26	0	42
	Diagnosed (NO)	Depression	512	5.25	6.44	0	37
		Anxiety	512	5.20	5.50	0	32
		Stress	512	11.01	8.11	0	40

N=1238

Students were then asked if they had ever been diagnosed with any of the following mental health disorders. Two hundred and seventy-one (22%) students reported "other" as the specific disorder, while 235 (19%) reported anxiety or depression. However, when asked if they *thought* they had any of the following mental health disorders, 776 (63%) reported depression or anxiety and 107 (9%) reported "other." For the remaining categorical variables, 1045 (85%) reported that they do not take medication for mental health disorders, 841 (68%) reported a history of trauma, 1113 (90%) deny suffering from chronic disease, 1128 (92%) deny alcohol or drug abuse, and 887 (72%) report that they have accessed formal mental health services in the past (Table 4).

Table 4. Specific Mental Health Disorders and DASS Scores

Mental Health Disorder		Construct	N	Mean	SD	Min	Max
Diagnosed with Depression	Diagnosed Depression (YES)	Depression	90	11.23	9.55	0	42
		Anxiety	90	7.56	6.21	0	28
		Stress	90	15.61	9.06	0	42
	Diagnosed Depression (NO)	Depression	1138	6.10	7.35	0	41
		Anxiety	1138	6.22	6.29	0	36
		Stress	1138	12.48	8.78	0	41
Diagnosed with Anxiety	Diagnosed Anxiety (YES)	Depression	145	7.83	7.73	0	36
		Anxiety	145	10.24	7.54	0	36
		Stress	145	17.22	8.93	1	41
	Diagnosed Anxiety (NO)	Depression	1083	6.30	7.62	0	42
		Anxiety	1083	5.79	5.91	0	34
		Stress	1083	12.11	8.65	0	42
Diagnosed with Other Mental Health Disorder	Diagnosed with Other Mental Health Disorder (YES)	Depression	271	7.08	8.56	0	39
		Anxiety	271	6.62	6.56	0	34
		Stress	271	13.56	9.17	0	40
	Diagnosed with Other	Depression	957	6.31	7.36	0	42
		Anxiety	957	6.23	6.21	0	36

	Mental Health Disorder (NO)	Stress	957	12.47	8.73	0	42
Not diagnosed but believe a mental health disorder is present	Depression (YES)	Depression	320	10.60	8.76	0	41
		Anxiety	320	8.74	7.35	0	36
		Stress	320	16.84	9.31	0	41
	Depression (NO)	Depression	908	5.03	6.63	0	42
		Anxiety	908	5.46	5.63	0	32
		Stress	908	11.26	8.19	0	42
	Stress (YES)	Depression	446	8.25	7.95	0	42
		Anxiety	446	8.35	6.56	0	34
		Stress	446	15.90	8.73	0	42
	Stress (NO)	Depression	782	5.47	7.28	0	41
		Anxiety	782	5.16	5.83	0	36
		Stress	782	10.89	8.38	0	40
	PTSD (YES)	Depression	39	11.90	9.46	0	36
		Anxiety	39	10.00	7.20	0	31
		Stress	39	19.00	8.88	2	37
	PTSD (NO)	Depression	1189	6.30	7.52	0	42
		Anxiety	1189	6.20	6.22	0	36
		Stress	1189	12.51	8.76	0	42
		Depression	12	12.92	7.09	1	22

	Bipolar (YES)	Anxiety	12	10.50	6.91	4	27
		Stress	12	20.75	5.53	12	32
	Bipolar (NO))	Depression	1216	6.41	7.63	0	42
		Anxiety	1216	6.28	6.27	0	36
		Stress	1216	12.63	8.83	0	42
	Schizophrenia (YES)	Depression	1	14.00	N/A	14	14
		Anxiety	1	15.00	N/A	15	15
		Stress	1	26.00	N/A	26	26
	Schizophrenia (NO)	Depression	1227	6.47	7.65	0	42
		Anxiety	1227	6.31	6.29	0	36
		Stress	1227	12.70	8.83	0	42
	Other (YES)	Depression	107	5.75	7.92	0	37
		Anxiety	107	4.62	4.55	0	21
		Stress	107	10.69	8.85	0	35
	Other (NO)	Depression	1121	6.55	7.62	0	42
		Anxiety	1121	6.48	6.41	0	36
		Stress	1121	12.91	8.85	0	42

N=1238

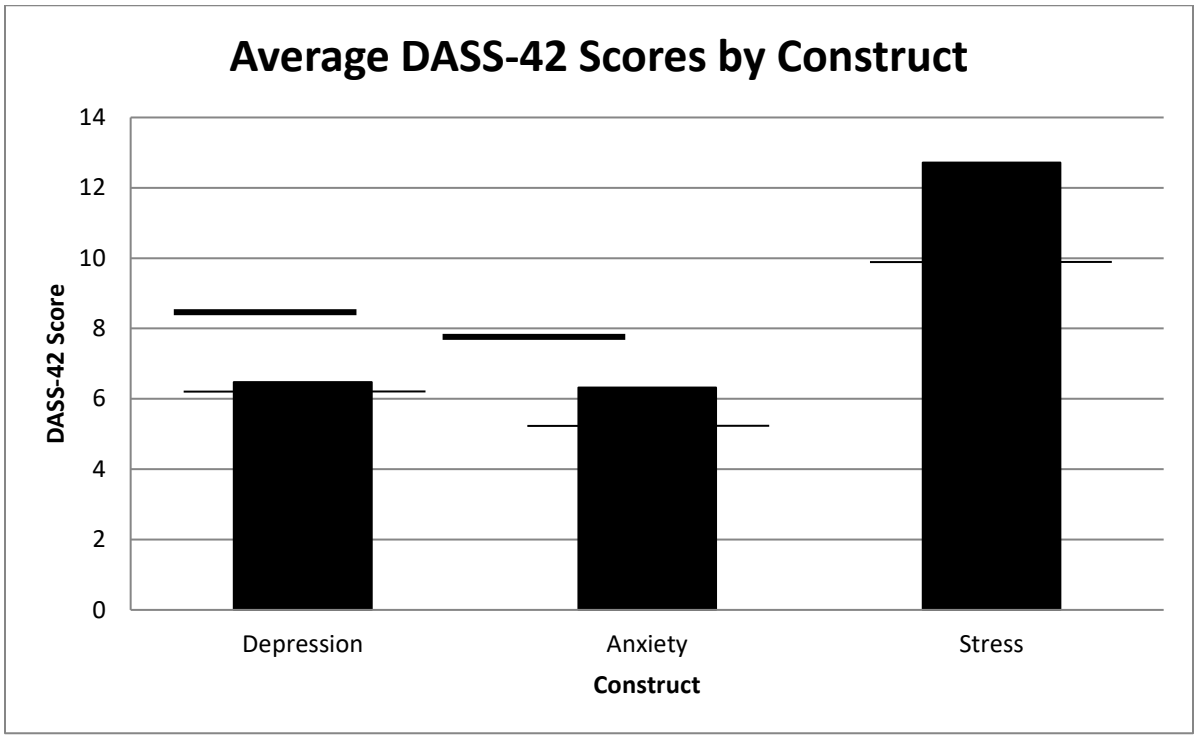
DASS-42 Scores

Depression, anxiety, and stress scores were calculated using the DASS-42 survey. Normative data indicates that the following scores represent the average for adults based on a college sample (Depression = 6, Anxiety = 5, Stress = 10). The overall scores for

this sample were above the average in all categories, and a one sample t-test analysis revealed a significant difference in each. The average score for stress was 12.713, *SD = 8.84, t(1227)=10.755, p<.005*. The average score for anxiety was 6.316 (*SD = 6.29), t(1227)=7.333, p<.005*. And, the average score for depression was 6.478 *(SD = 7.65), t(1227)=2.91, p=.029.* The minimum score for all constructs is 0. The maximum score for depression was 42, anxiety was 36, and stress was 42 (Table 1).

The overall results showed that 24.4% of DPT students scored above the average for depression, 32.8% for anxiety, and 36.2% for stress (Figure 2). The DASS-42 scores were then sub-divided into severity categories of normal, mild, moderate, severe, and extremely severe (Figure 3). All 3 constructs demonstrated the majority of the scores in the mild range, however both anxiety and stress had the next highest percentage of scores in the moderate range.

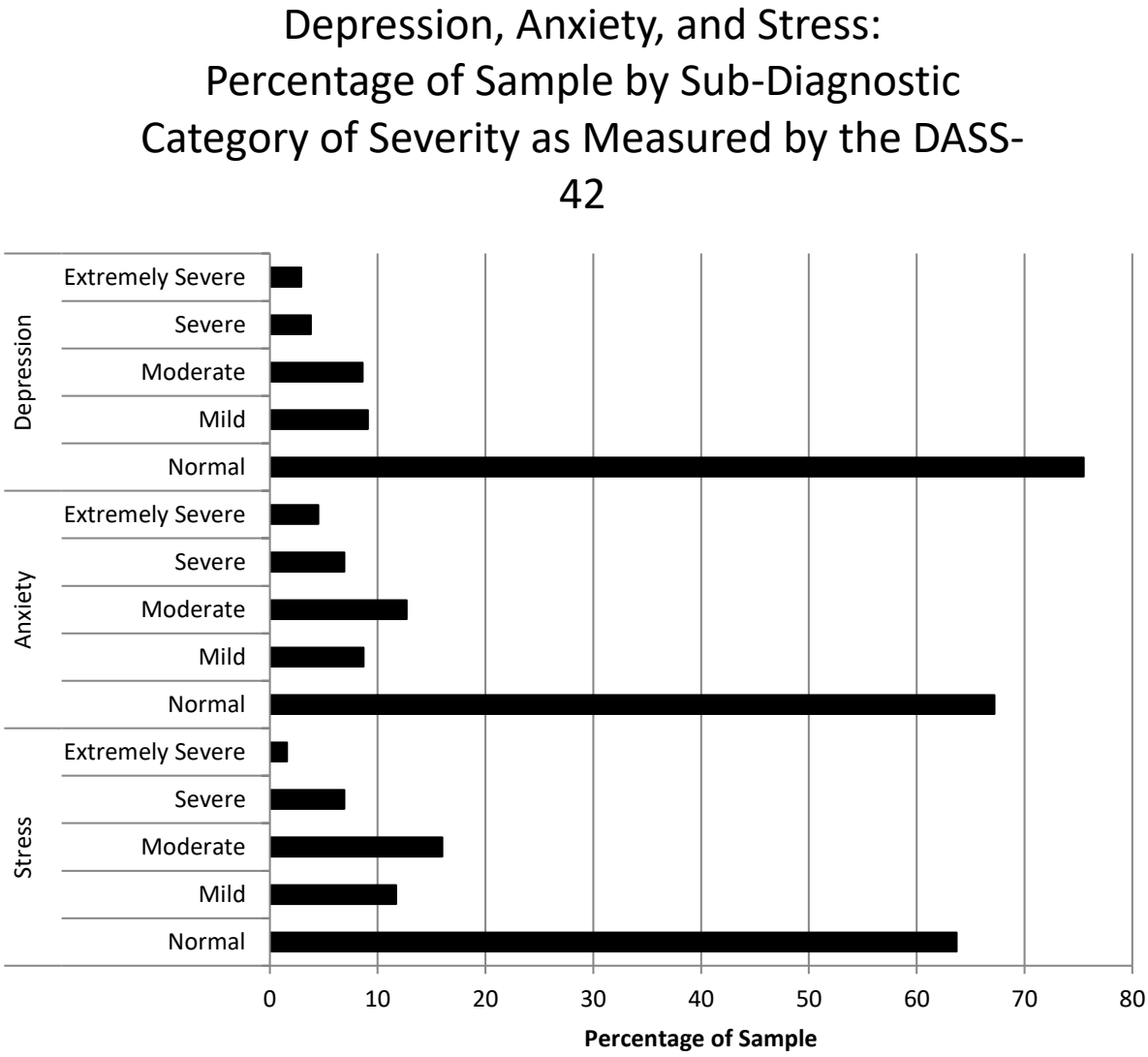
Figure 2. Participants' Average DASS-42 Scores for Depression, Anxiety, and Stress



N=1238, Depression p = .03, Anxiety p≤ .05, Stress p ≤ .05

*Thin, Horizontal lines represent average score from college-aged adults (normative data).

Figure 3. Depression, Anxiety, and Stress: Percentage of Sample by Sub-diagnostic Category of Severity as Measured by the DASS-42.



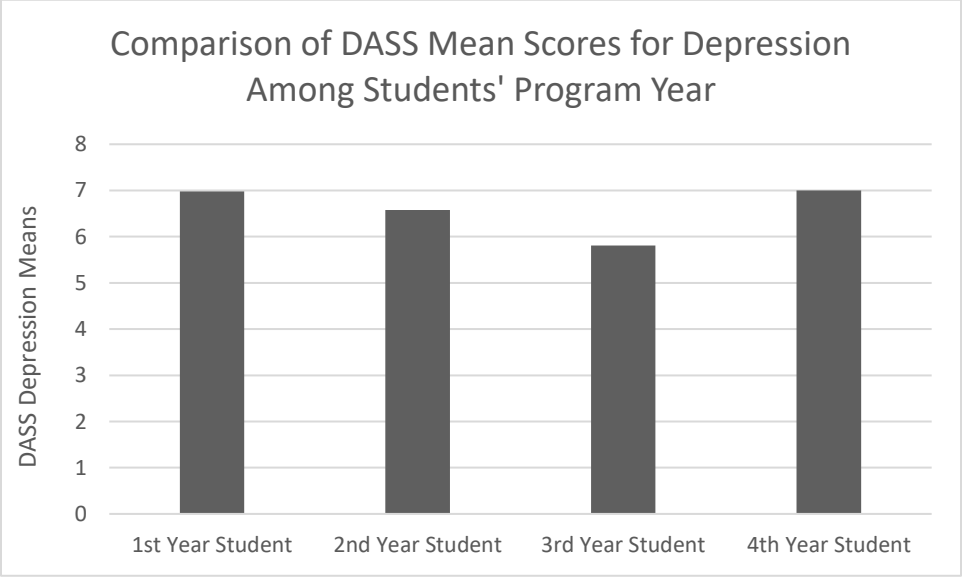
N=1238

Differences Among Variables

Comparing Depression, Anxiety, & Stress Among Students' Program Year

To determine if any differences existed between 1st, 2nd, 3rd and 4th (and beyond) year students, a one-way independent ANOVA was used. For depression, the number in each group was different, however, the homogeneity of variance assumption was met at p=.309. Therefore, the use of a parametric test was appropriate. The mean score for depression per group was as follows: 1st year, 6.98 (SD = 7.68), 2nd year, 6.58 (SD=8.15), 3rd year, 5.81 (SD= 6.95), 4th year, 7.00 (SD=7.06). The ANOVA analysis showed no significant difference in depression scores among the groups at F(2, 1223) = 1.541, p=.202 (Figure 4).

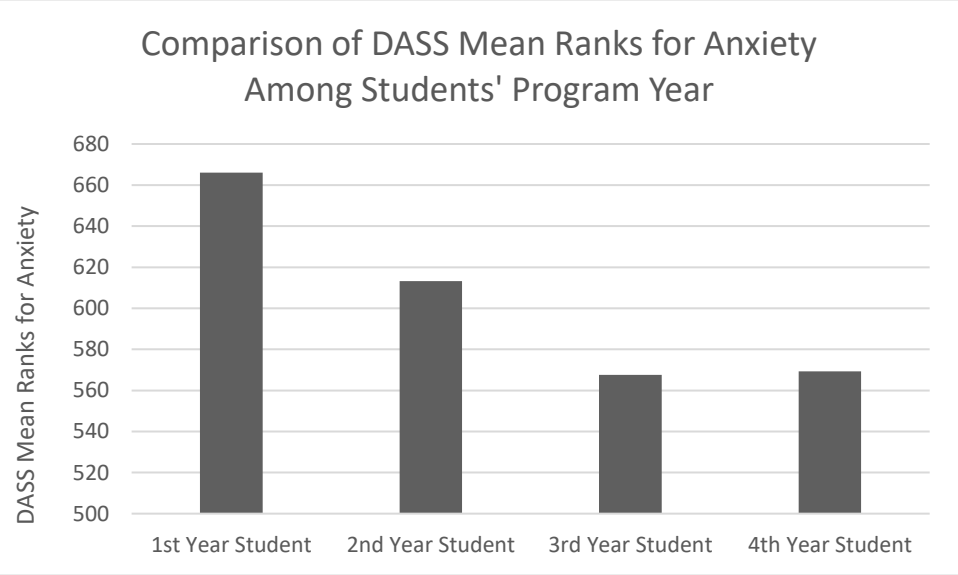
Figure 4. Comparison of DASS Mean Scores for Depression Among Students' Program Year



N=1238, Depression p=.202

Anxiety was assessed using the Kruskal-Wallis test because the homogeneity of variance was not met at p= .01 in this category. Therefore, a non-parametric test was required. There was a significant difference at $\chi^2(3)=14.769$, p=.002. The mean rank for anxiety per group was as follows: 1st year, 666.00, 2nd year, 613.29, 3rd year, 567.52, and 4th year, 569.25. The post-hoc tests revealed a significant difference between 1st and 3rd year students at p=.001, with 1st year students reporting higher levels of anxiety (Figure 5).

Figure 5. Comparison of DASS Mean Ranks for Anxiety Among Students' Program Year

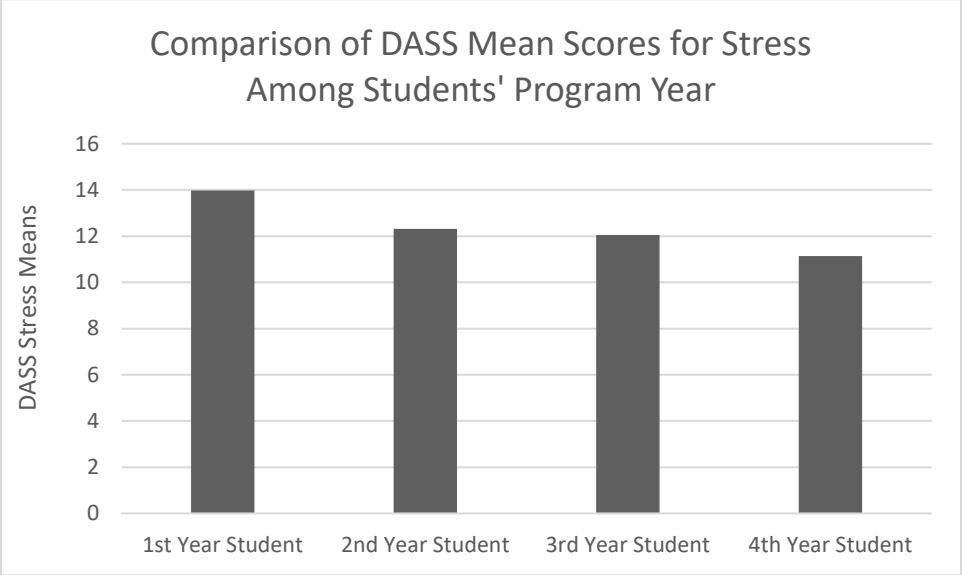


N=1238, Anxiety p=.002

To determine if any differences for stress among 1st, 2nd, 3rd and 4th (and beyond) year students existed, a one-way independent ANOVA was used. The homogeneity of variance assumption was met at p=.286, and therefore a parametric test was appropriate. The mean score for stress per group was as follows: 1st year, 13.98 (SD=9.05), 2nd year, 12.31 (SD=8.79), 3rd year, 12.06 (8.67), 4th year, 11.14 (SD=7.33). There was a

significant difference among groups at F(3, 1223)=3.828, p=.010. The Bonferroni post-hoc revealed significant differences between 1st and 2nd year students (p=.040) and 1st and 3rd year students (p=.019). In both cases, the 1st year students demonstrated higher levels of stress (Figure 6).

Figure 6. Comparison of DASS Mean Scores for Stress Among Students' Program Year



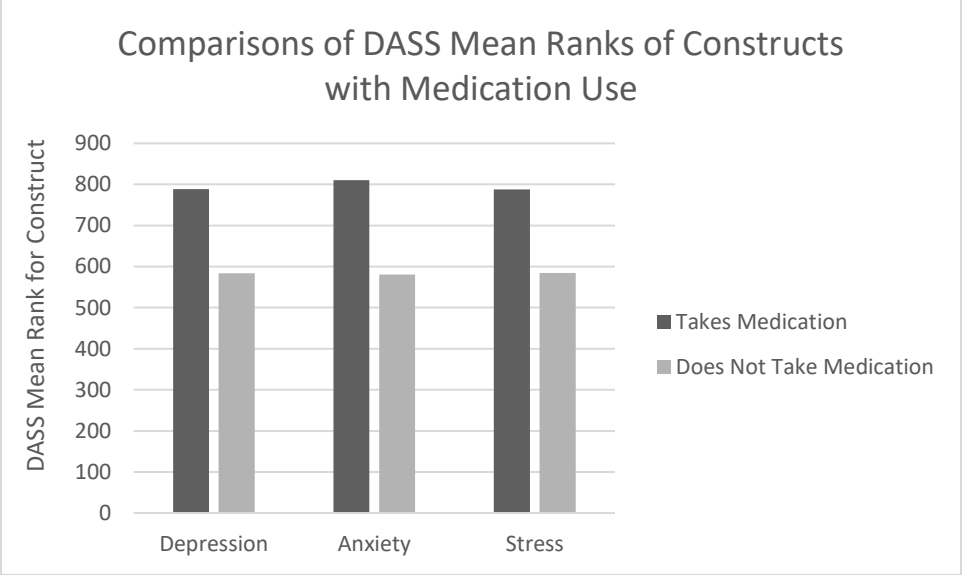
N=1238, Stress, 1st and 2nd year students (p=.040) and 1st and 3rd year students (p=.019).

Comparing Depression, Anxiety, and Stress with Medication Use

To determine if any differences existed between those who used medication and those who did not, an independent t-test was used. However, the homogeneity of variance assumption was not met for anxiety and depression at p= ≤.005. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for all constructs at p≤.005. For depression the U=63, 804.00,

anxiety=59,825.500, and stress=63, 957.00. In all cases, a higher mean rank was associated with medication use (Depression; yes, 788.34, no, 584.06, Anxiety; yes, 810.08, no, 580.25, Stress; yes, 787.51, no, 584.20). Those who used medication demonstrated higher depression, anxiety, and stress scores than those who do not (Figure 7).

Figure 7. Comparison of DASS Mean Ranks of Constructs with Medication Use



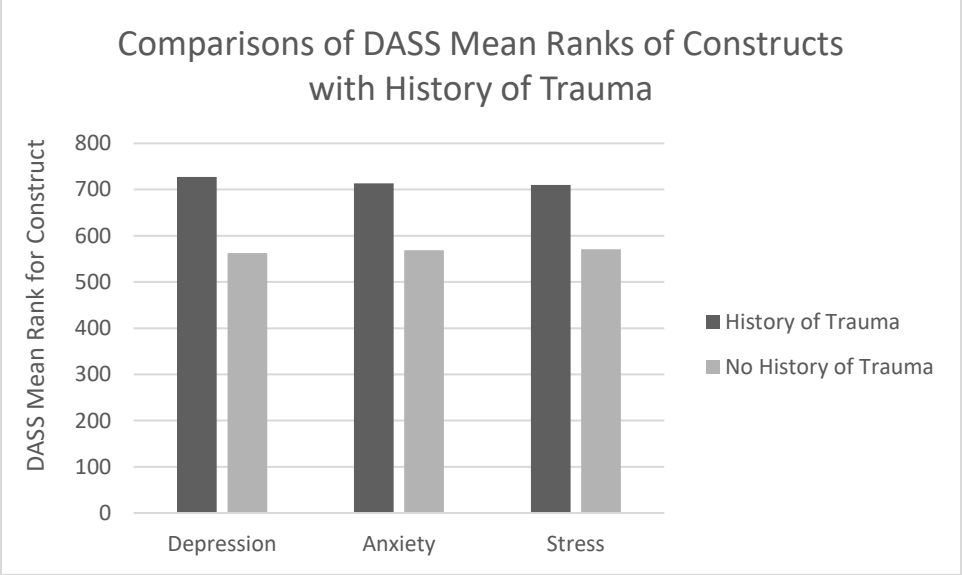
N=1238, All constructs p≤.005

Comparing Depression, Anxiety, and Stress with History of Trauma

To determine if any differences existed between those with a history of trauma and those without, an independent t-test was used. However, the homogeneity of variance assumption was not met for anxiety at p= .002 and depression at p= ≤.005. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for all constructs at p≤.005. For depression the U = 119,070.00,

anxiety= 24, 355.00, and stress=25, 694.00. In all cases, a higher mean rank was associated with a history of trauma as follows (Depression; yes, 727.33 no, 562.58, Anxiety; yes, 713.67, no, 568.87, Stress; yes, 710.21, no, 570.46). Those who had a history of trauma demonstrated higher depression, anxiety, and stress scores than those without a history of trauma (Figure 8).

Figure 8. Comparisons of DASS Mean Ranks of Constructs with History of Trauma



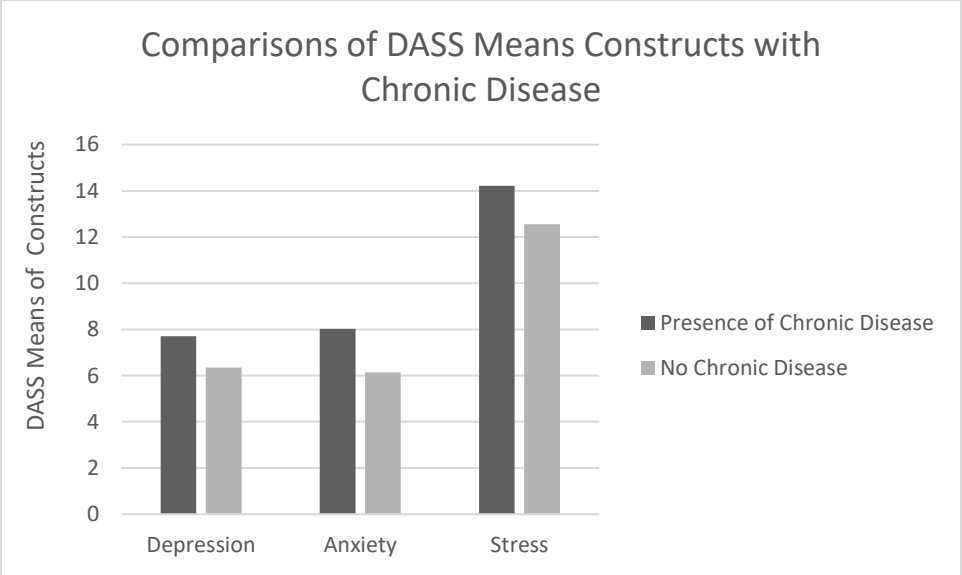
N=1238, All constructs $p \leq .005$

Comparing Depression, Anxiety, and Stress with Chronic Disease

To determine if any differences existed between those with chronic disease and those without, an independent t-test was used. The homogeneity of variance assumption was met at $p \geq .280$. There was no significant difference for depression or stress at $p=.071$ and $p=.055$ respectively, however there was a significant difference for anxiety at

t(1226) = 3.058, p=.002. Those with chronic disease showed higher anxiety scores than those who did not (Figure 9).

Figure 9. Comparisons of DASS Means Constructs with Chronic Disease

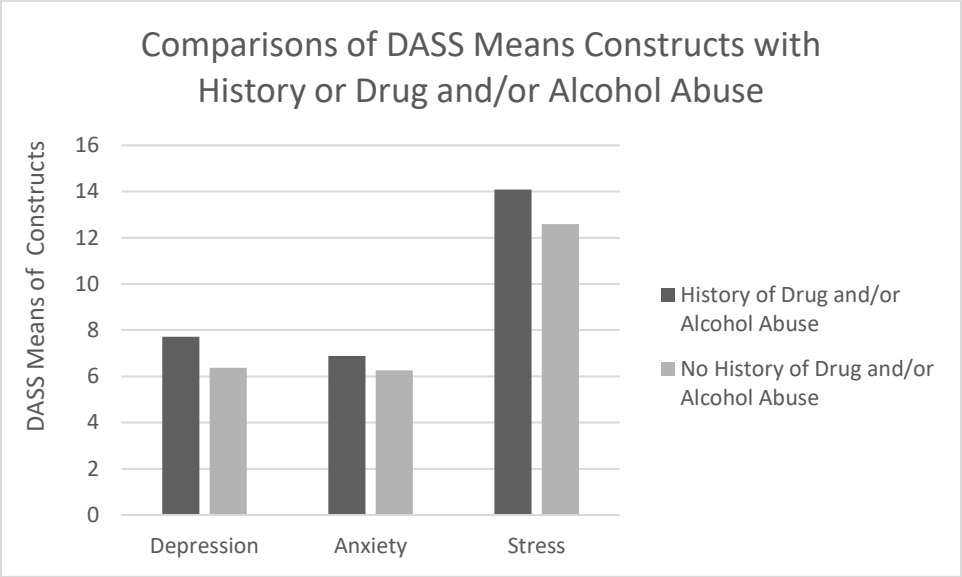


N=1238, Depression p=.071, Anxiety p=.002, Stress p=.071

Comparing Depression, Anxiety, and Stress in Individuals with a History of Drug or Alcohol Abuse

To determine if any differences existed between those with history of drug or alcohol abuse and those without, an independent t-test was used. The homogeneity of variance assumption was met at p≥.18. There was no significant difference for depression, p= .093, anxiety, p= .341, or stress, p=.104 (Figure 10).

Figure 10. Comparisons of DASS Means Constructs with History of Drug and/or Alcohol Abuse

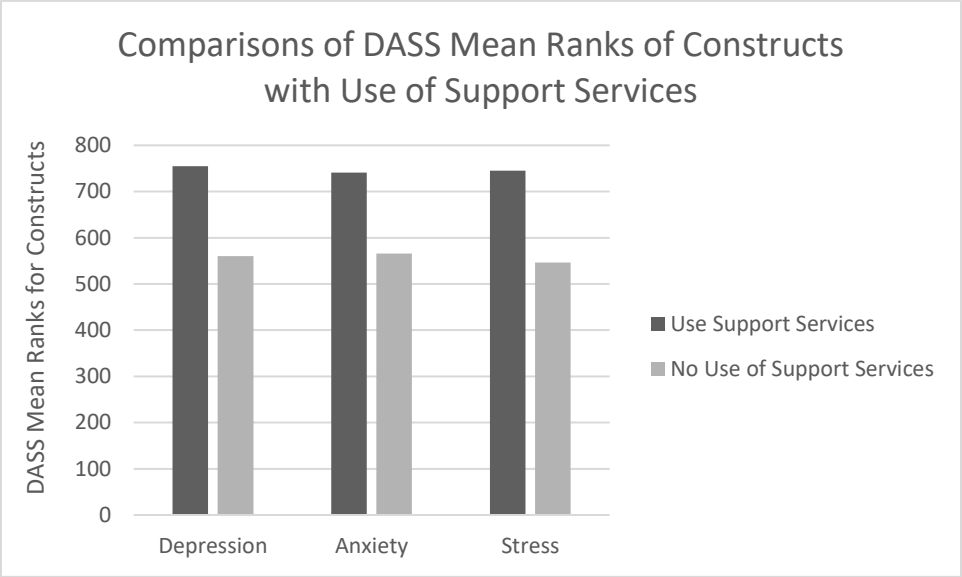


N=1238, Depression p= .093, Anxiety p= .341, Stress p=.104.

Comparing Depression, Anxiety, and Stress with Use of Support Services

To determine if any difference existed between those who used support services and those who did not, an independent t-test was attempted. However, the homogeneity of variance assumption was not met for anxiety and depression at p= ≤.005, or stress at p=.007. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for all constructs at p≤.005. For depression the U=103,326.500, anxiety=108,068.500, and stress=106,761.500. In all cases, a higher mean rank was associated with use of support services (Depression; yes, 754.99 no, 560.49, Anxiety; yes, 741.08 no, 565.84, Stress; yes, 744.92, no, 546.36.) Those who utilized support services demonstrated higher depression, anxiety, and stress scores (Figure 11).

Figure 11. Comparisons of DASS Mean Ranks of Constructs with Use of Support Services

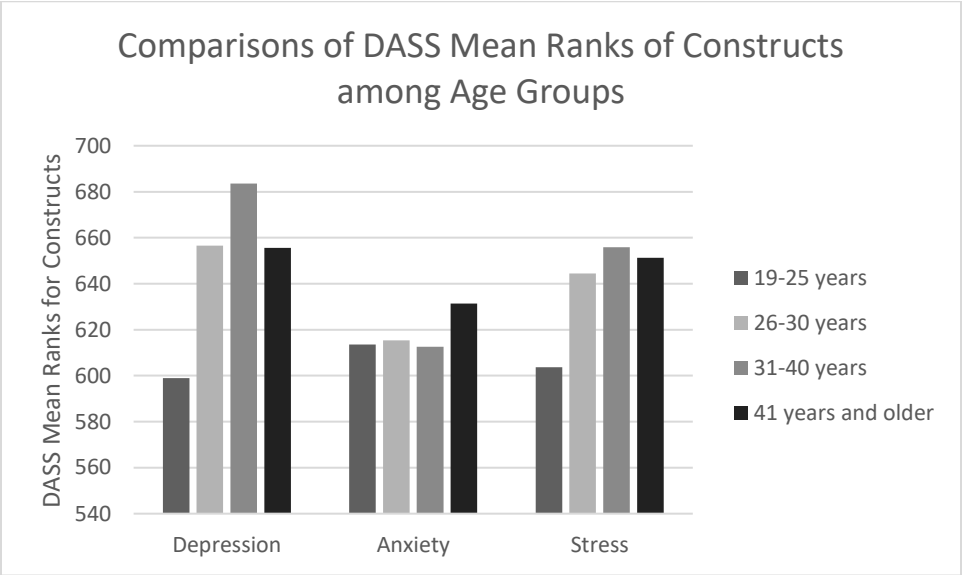


N=1238, All constructs $p \leq .005$

Comparing Depression, Anxiety, and Stress Among Age Groups

To determine if any differences existed between age groups, a one-way independent ANOVA was attempted. Homogeneity of variance assumption was not met for depression at p=.036 or stress at p = .02. Therefore, a non-parametric test was required. Age was assessed using the Kruskal-Wallis test. As noted in Figure 12, there were no significant differences for any of the constructs, depression, p=.052, anxiety, p=.998, and stress, p=.327.

Figure 12. Comparisons of DASS Mean Ranks of Constructs Among Age Groups

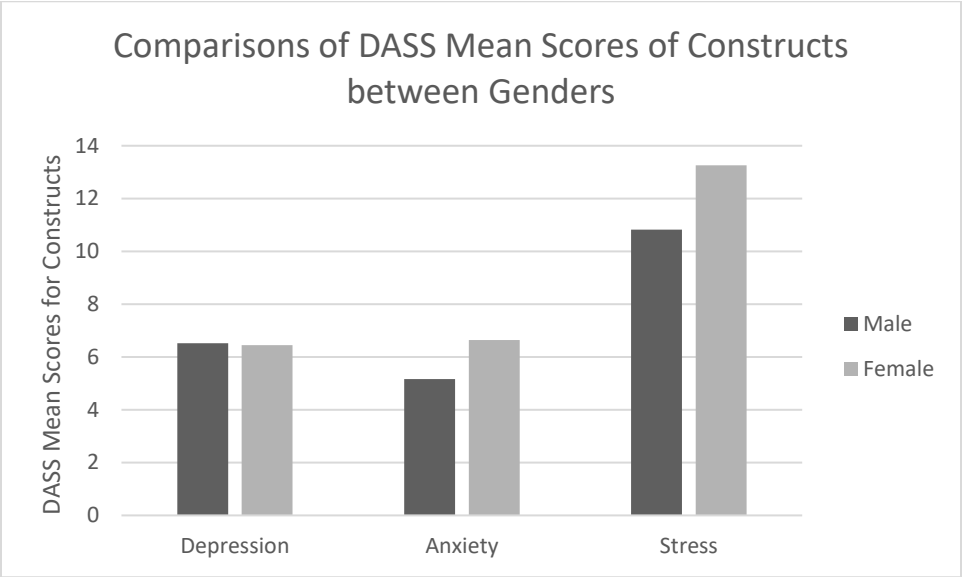


N=1238, Depression, p=.052, Anxiety, p=.998, and Stress, p=.327

Comparing Depression, Anxiety, and Stress Between Genders

To determine if any differences existed between male and female, an independent t-test was used. The homogeneity of variance assumption was met at $p \geq .10$. There was a significant difference for anxiety and stress at $t(1224)=-.3.49$ $p=.001$ and $t(1224)$ -4.18, $p=\leq .005$ respectively. Females were found to have higher stress and anxiety scores than males (Figure 13).

Figure 13. Comparisons of DASS Mean Scores of Constructs Between Genders

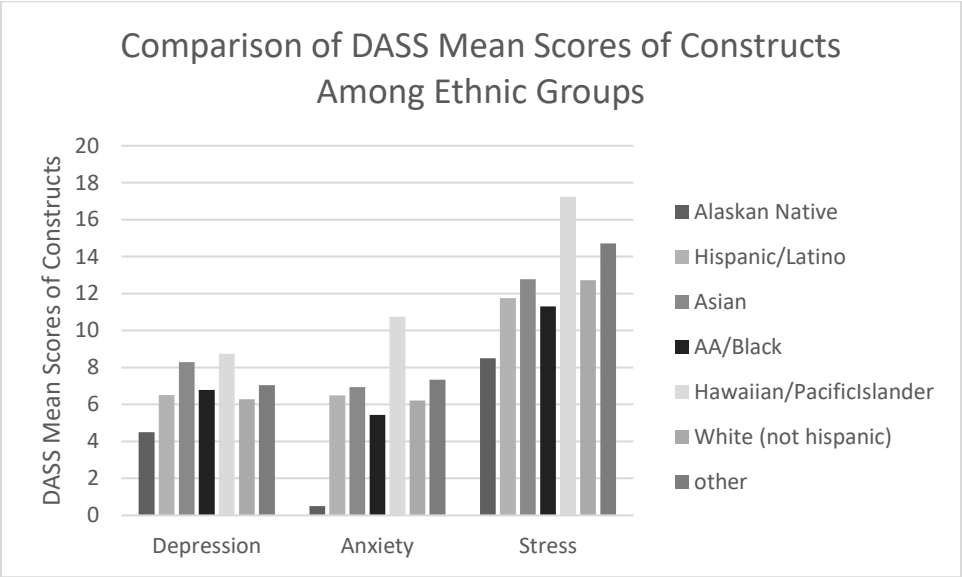


N=1238, Anxiety p=.001, Stress p=≤.005

Comparing Depression, Anxiety, & Stress Across Ethnicity/Races

To determine if any differences existed among ethnic groups, a one-way independent ANOVA was used. The homogeneity of variance assumption was met at p≥.14. Therefore, the use of a parametric test was appropriate. As noted in Figure 14, there were no significant differences among the ethnic groups (Depression, p=.476, Anxiety, p=.383, and Stress, p=.515.)

Figure 14. Comparison of DASS Mean Scores of Constructs Across Ethnic Groups

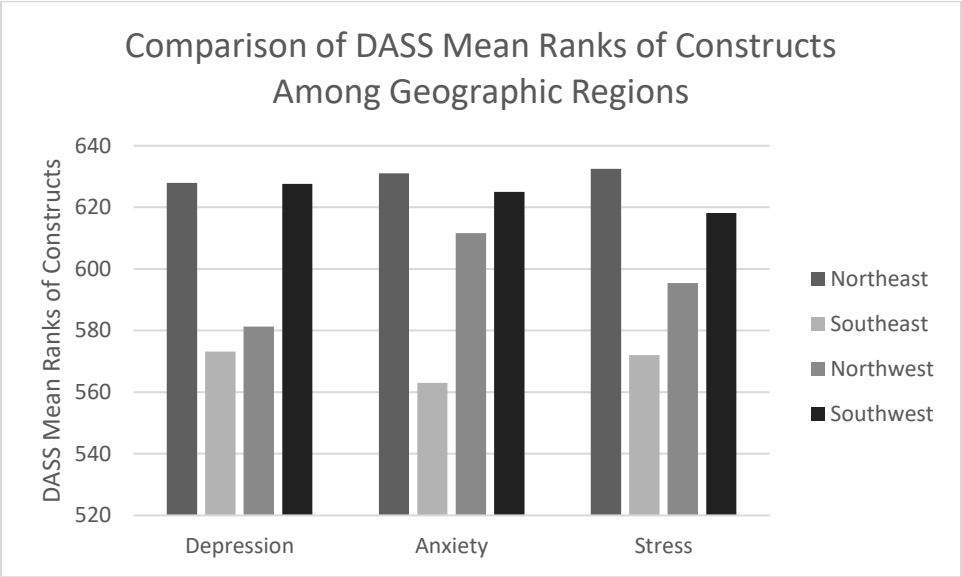


Depression, p=.476, Anxiety, p=.383, and Stress, p=.515.

Comparing Depression, Anxiety, & Stress Among Geographic Regions

To determine if any differences existed between geographic regions, a one-way independent ANOVA was attempted. The homogeneity of assumption was not met for depression at p=.02, therefore a non-parametric test was used. Geographic region was assessed using the Kruskal-Wallis. Only anxiety was found to be significant at $\chi^2(3) = 8.781$, p=.032. The mean ranks for anxiety per group were as follows (SE, 563.01, NE, 631.02, SW, 625.07, NW, 611.59.) As a follow up, pairwise comparisons were performed. The only significant comparison was between the southeast (SE) and northeast (NE) regions with an adjusted p value of .039. Adjustment was made to control for the number of tests performed. The NE region was found to demonstrate higher anxiety scores than the SE region (Figure 15).

Figure 15. Comparison of DASS Mean Ranks of Constructs Among Geographic Regions



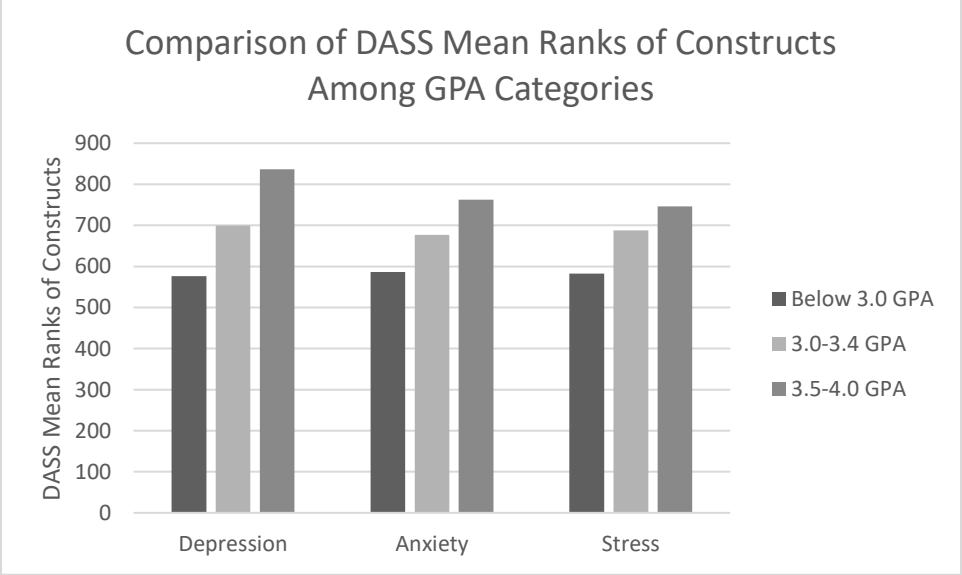
N =1238, Anxiety p=.032

Comparing Depression, Anxiety & Stress Among GPA Categories

To determine if any differences existed among 3 GPA categories, a one-way independent ANOVA was attempted. The homogeneity of variance assumption was not met for depression or anxiety, p=.≤005 and p=.006 respectively. Therefore, the use of a non-parametric test was appropriate. The Kruskal-Wallis test demonstrated significant differences between groups. Pairwise comparisons revealed significant differences between the 3.5-4.0 GPA group when compared with both the 3.0-3.4 GPA group at an adjusted p=≤.005 and less than 3.0 GPA group at an adjusted p=.001. A significant difference was found for depression at $\chi^2(2)=39.35$, p≤.005. The mean ranks of depression by group are: (GPA of 3.5-4.0), 576.09, (GPA of 3.0-3.4), 699.13, (GPA of <3.0), 836.56. A significant difference was found for anxiety at $\chi^2(2)=20.16$, p≤.005. The mean ranks for anxiety by group are: (GPA of 3.5-4.0), 586.48 (GPA of 3.0-3.4),

676.83, (GPA of <3.0), 762.65. Pairwise comparisons revealed significant differences between the 3.5-4.0 GPA group when compared with both 3.0-3.4 GPA group at an adjusted p=≤.005 and less than 3.0 GPA group at an adjusted p=.037. Finally, a significant difference was found for stress at $\chi^2(2) = 24.525$, p≤.005. The mean ranks of stress by group are: (GPA of 3.5-4.0), 582.86, (GPA of 3.0-3.4), 688.03, (GPA of <3.0), 745.98. Pairwise comparisons revealed significant differences between the 3.5-4.0 GPA group when compared with both 3.0-3.4 GPA group at an adjusted p=≤.005. Participants with GPA scores less than 3.0 demonstrated higher depression, anxiety, and stress scores (Figure 16).

Figure 16. Comparison of DASS Mean Ranks of Constructs Among GPA Categories

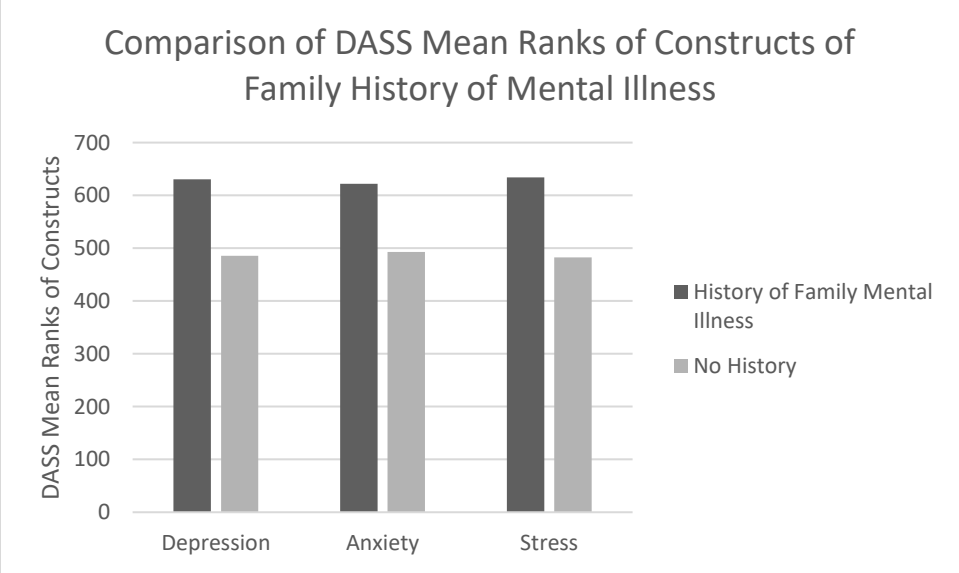


N =1238, Depression p≤.005, Anxiety p≤.005, Stress p≤.005

Comparing Depression, Anxiety, and Stress Between Family Histories

To determine if any differences existed between those with a family history of mental health disorder and those without, an independent t-test was used. Homogeneity of variance assumption was not met at $p \leq .04$. Therefore, Mann Whitney U tests were used for the comparisons. This revealed significant differences for all constructs at $p \leq .005$. For depression the U=190,743, anxiety U=186,396, and stress U=192,635.5. In all cases, a higher mean rank was associated with a family history of mental illness (Depression; yes, 630.46 no, 485.5, Anxiety; yes, 621.87 no 492.78 Stress; yes, 634.2, no, 482.33.) As noted in Figure 17, those with a family history of mental health disorder demonstrated higher depression, anxiety, and stress scores.

Figure 17. Comparison of DASS Mean Ranks of Constructs of Family History of Mental Illness



N=1238, All Constructs $p \leq .005$

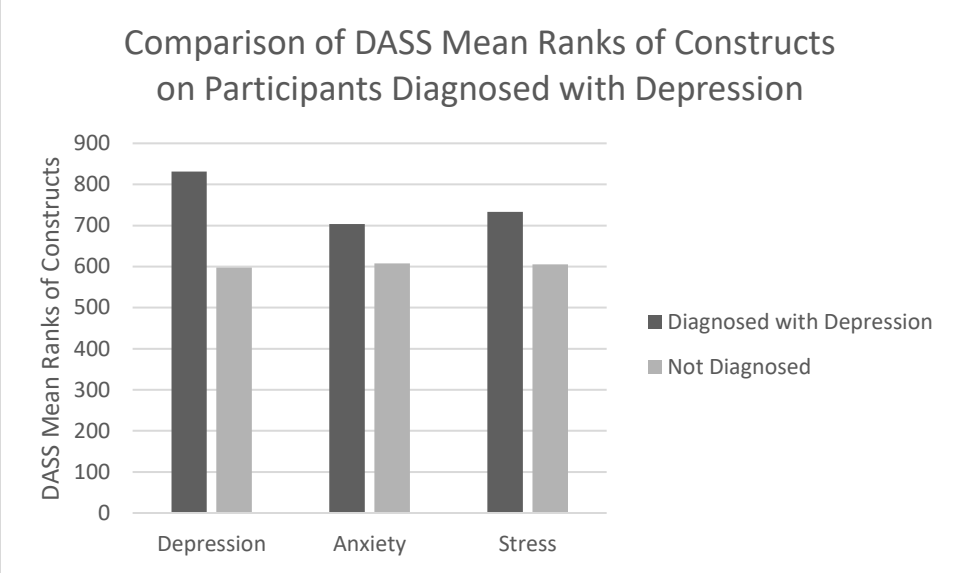
Comparing Depression, Anxiety, & Stress Among those Diagnosed with a Mental Health Disorder

To determine if any differences existed between those diagnosed with a mental health disorder and those who have not, an independent t-test as used. The homogeneity of variance assumption was not met at $p \leq .001$. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for all constructs at $p \leq .005$. For depression the U=221,362.000, anxiety U=228,350.000, and stress U=232,399.000. In all cases, a higher mean rank was associated with a diagnosis of a mental health disorder (Depression; yes, 688.85 no, 561.34, Anxiety; yes, 702.50 no, 551.58, Stress; yes, 710.40, no, 545.92). Those who had a diagnosed mental health disorder demonstrated higher depression, anxiety, and stress scores.

Comparing Depression, Anxiety, and Stress Among those Diagnosed with Depression

To determine if any differences existed between those diagnosed with depression and those who have not, an independent t-test was used. The homogeneity of variance assumption was not met at $p \leq .005$ for depression. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for all constructs (Depression, $p \leq .005$, Anxiety, $p = .013$, Stress, $p = .001$. For depression the U=70,727.500, anxiety U=59,190.500, and stress U=61,897.000. In all cases, a higher mean rank was associated with a diagnosis of depression (Depression; yes, 831.36, no, 597.35, Anxiety; yes, 703.17, no, 607.49, Stress; yes, 733.24, no, 605.11). As seen in Figure 18, those who had a diagnosis of depression demonstrated higher depression, anxiety, and stress scores.

Figure 18. Comparison of DASS Mean Ranks of Constructs on Participants Diagnosed with Depression

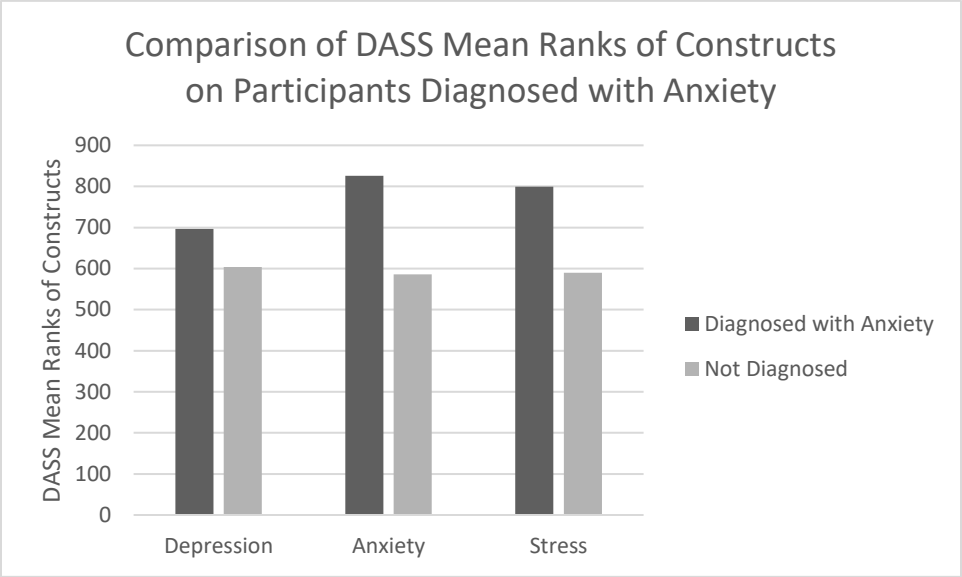


N=1238, Depression, p≤.005, Anxiety, p=.013, Stress, p=.001

Comparing Depression, Anxiety, and Stress Among those Diagnosed with Anxiety

To determine if any differences existed between those diagnosed with anxiety and those who have not, a Mann-Whitney U test was used for the comparisons. This revealed significant differences for all constructs (Depression, p=.003, Anxiety, p≤.005, Stress, p≤.005). For depression the U=90,372.000, anxiety U=109,118.500, and stress U=105,665.000. In all cases, a higher mean rank was associated with a diagnosis of anxiety (Depression; yes, 696.26, no, 603.55, Anxiety; yes, 825.54, no, 586.24, Stress; yes, 799.43, no, 589.74). Those who had a diagnosis of anxiety demonstrated higher depression, anxiety, and stress scores (Figure 19).

Figure 19. Comparison of DASS Mean Ranks of Constructs on Participants Diagnosed with Anxiety

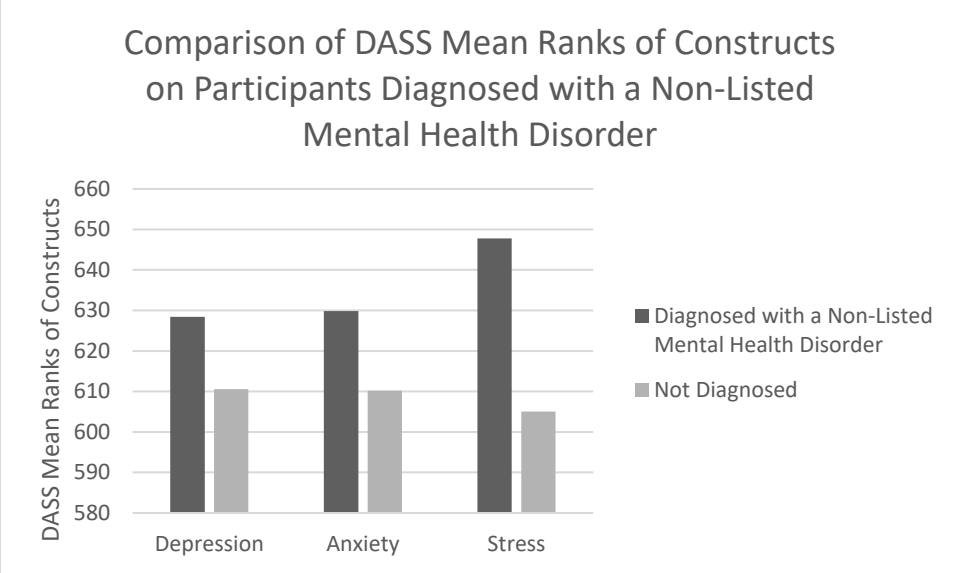


N=1238, Depression, p=.003, Anxiety, p≤.005, Stress, p≤.005

Comparing Depression, Anxiety, and Stress Among those Diagnosed with a Non-Listed Mental Health Disorder

To determine if any differences existed between those diagnosed with a mental health disorder that was not specifically listed (depression, anxiety, PTSD, bipolar, or schizophrenia) as compared to those who did not select this category, an independent t-test was used. The homogeneity of variance assumption was not met at p=.012 for depression. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed no significant differences for depression at p=.462, anxiety at p=418, or stress at p=.080. There was no difference in depression, anxiety, or stress scores in those that indicated they were diagnosed with a non-listed mental disorder and those who did not (Figure 20).

Figure 20. Comparison of DASS Mean Ranks of Constructs on Participants Diagnosed with a Non-Listed Mental Health Disorder



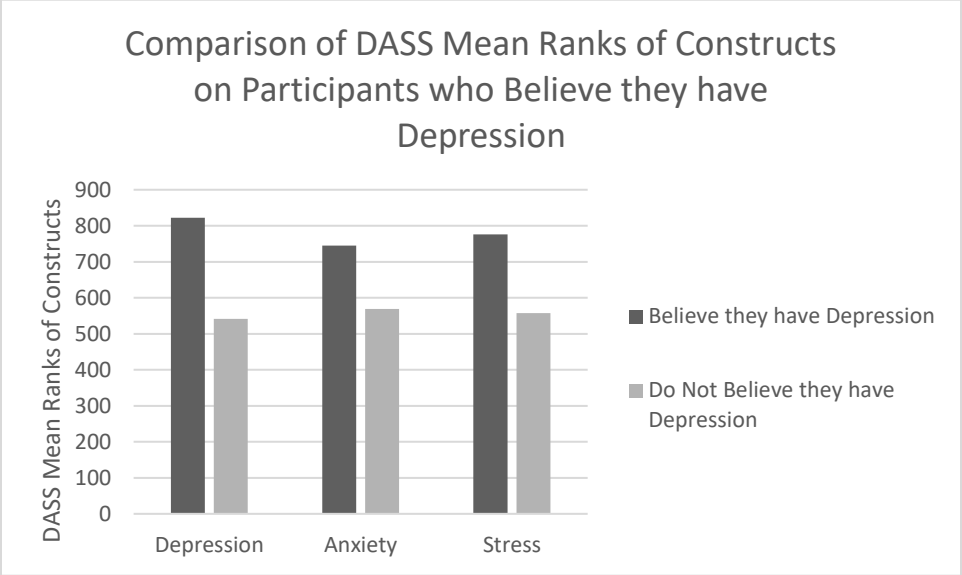
N=1238, Depression p=.462, Anxiety p=418, Stress p=.080.

Comparing Depression, Anxiety, & Stress Among Those Who Believe They Have Depression But Have Not Been Diagnosed.

To determine if any differences existed among those who believe they have depression, but have not been diagnosed, and those who do not believe they have depression, a t-test was used. The homogeneity of variance assumption was not met at $p \leq .005$. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for all constructs at $p \leq .005$; (depression U=211,841.500, anxiety U=186,917.000, and stress U=196946.500). In all cases, a higher mean rank was associated with those who believe they have depression (Depression; yes, 822.50, no, 541.19, Anxiety; yes, 744.62, no, 568.64, Stress; yes, 775.96, no, 557.60). Those who

believe they have depression demonstrated higher depression, anxiety, and stress scores, as noted in Figure 21.

Figure 21. Comparison of DASS Mean Ranks of Constructs on Participants who Believe they have Depression



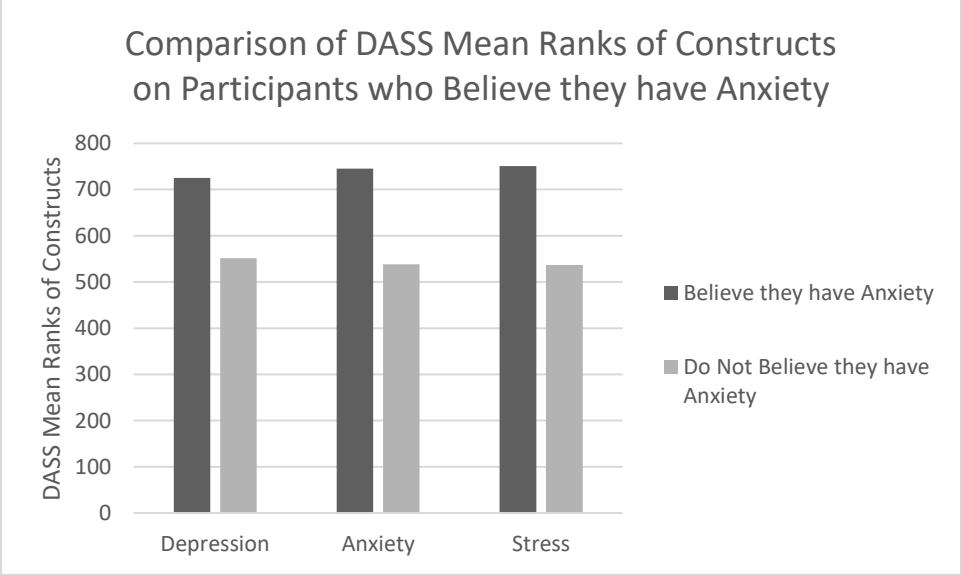
N=1238, All constructs $p \leq .005$

Comparing Depression, Anxiety, & Stress Among Those Who Believe They Have Anxiety But Have Not Been Diagnosed.

To determine if any differences existed among those who believe they have anxiety, but have not been diagnosed, and those who do not believe they have anxiety, a t-test was used. The homogeneity of variance assumption was not met for depression ($p=.004$) or anxiety ($p=.001$). Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for all constructs at $p \leq .005$. For depression the $U=223,785.000$, anxiety $U=234,009.500$, and stress $U=235,335.500$. In

all cases, a higher mean rank was associated with those who believe they have anxiety (Depression; yes, 725.26, no, 551.33, Anxiety; yes, 745.18, no, 538.26, Stress; yes, 751.16, no, 536.56). Those who believe they have anxiety demonstrated higher depression, anxiety, and stress scores as noted in Figure 22.

Figure 22. Comparison of DASS Mean Ranks of Constructs on Participants who Believe they have Anxiety



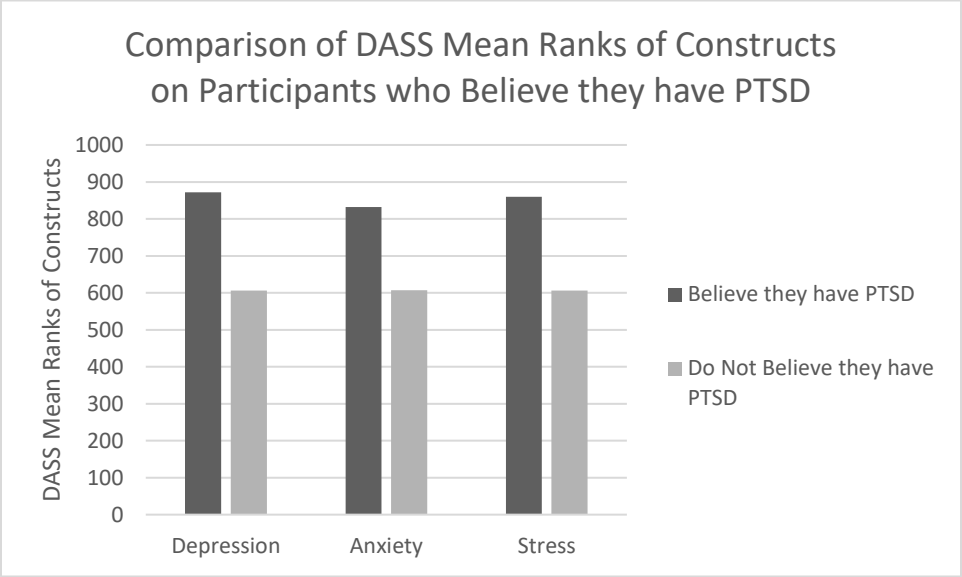
N=1238, All constructs at $p \leq .005$

Comparing Depression, Anxiety, & Stress Among Those Who Believe They Have PTSD But Have Not Been Diagnosed.

To determine if any differences existed among those who believe they have PTSD, but have not been diagnosed, and those who do not believe they have PTSD, a t-test was used. The homogeneity of variance assumption was not met for depression ($p=.019$). Therefore, Mann-Whitney U tests were used for the comparisons. This revealed

significant differences for all constructs at p≤.005. For depression the U=33,237.500, anxiety U=31,682.500, and stress U=32,768.500. In all cases a higher mean rank was associated with those who believe they have PTSD (Depression; yes, 872.24, no, 606.05, anxiety; yes, 832.37, no, 607.35, stress; yes, 860.22, no, 606.44. Those who believe they have PTSD demonstrated higher depression, anxiety, and stress scores (Figure 23).

Figure 23. Comparison of DASS Mean Ranks of Constructs on Participants who Believed they have PTSD



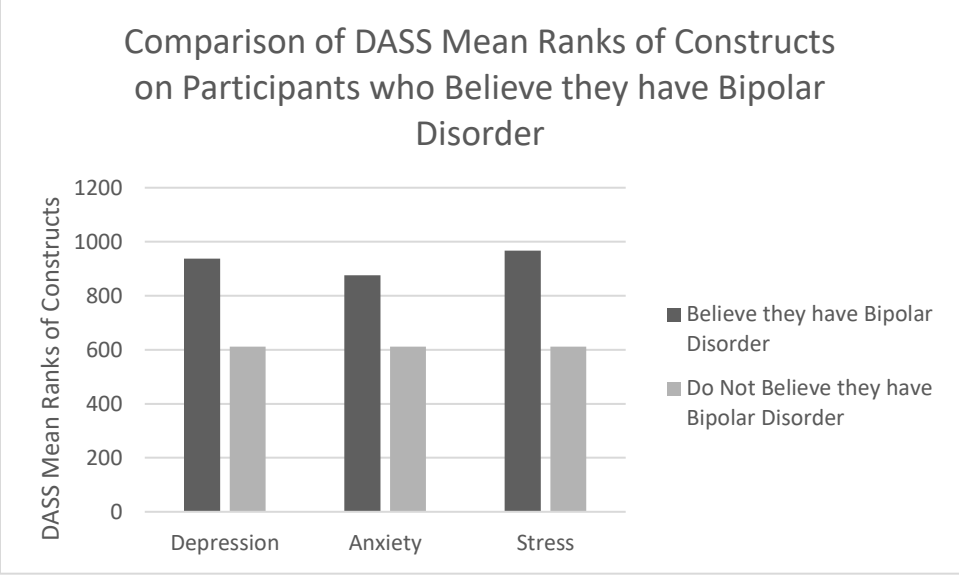
N=1238, All constructs p=≤.005

Comparing Depression, Anxiety, & Stress Among Those Who Believe They Have Bipolar Disorder But Have Not Been Diagnosed.

To determine if any differences existed among those who believe they have bipolar disorder, but have not been diagnosed with those who do not believe they have bipolar disorder, a t-test was used. The homogeneity of variance assumption was not met

for stress (p=.029). Therefore, Mann-Whitney U tests were used for the comparisons. This revealed significant differences for depression at p=.001, anxiety at p=.010, and stress at p=.001. For depression the U=11,166.500, anxiety U=10,430.500, and stress U=11,524.500. In all cases a higher mean rank was associated with those who believe they have bipolar disorder (Depression; yes, 937.04, no, 611.32, anxiety; yes, 875.71, no, 611.92, stress; yes, 966.88, no, 611.02. Those who believe they have bipolar disorder demonstrated higher depression, anxiety and stress scores (Figure 24).

Figure 24. Comparison of DASS Mean Ranks of Constructs on Participants who Believe they have Bipolar Disorder

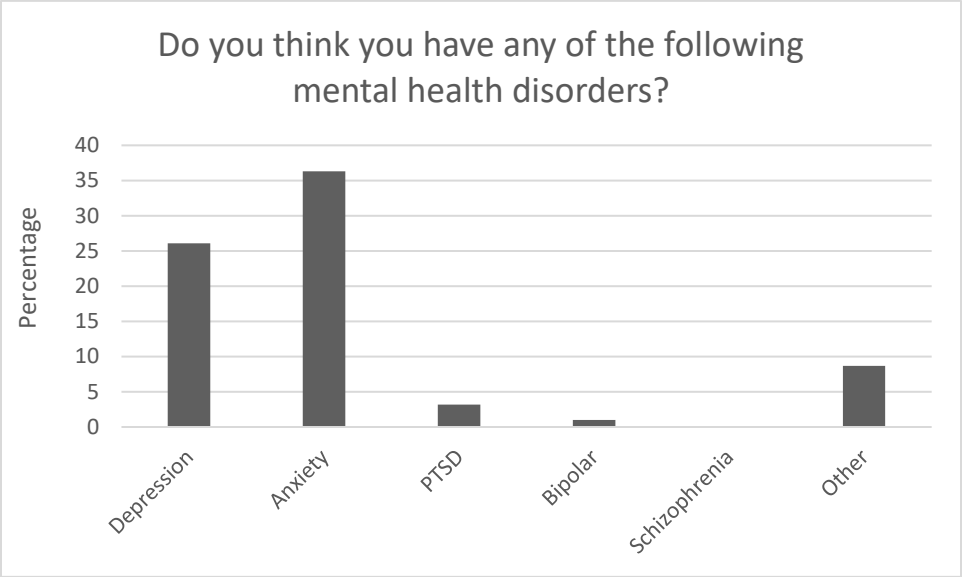


N=1238, Depression p=.001, Anxiety p=.010, Stress p=.001.

Comparing Depression, Anxiety, and Stress Among Those Who Believe They Have A Mental Disorder ("other") But Have Not Been Diagnosed.

A t-test was used to determine if any differences existed among those who believe they have some "other" mental disorder, but have not been diagnosed and those who do not believe they have some "other" mental disorder. The homogeneity of variance assumption was not met for anxiety at p=.001. Therefore, Mann-Whitney U tests were used for the comparisons. This revealed a non-significant difference of p=.06 for depression. Anxiety was significantly different at p=.011 and stress was significantly different at p=.006. For anxiety the U=51,046.500 and stress U=50,268.500. In both cases, those who believed they had some "other" disorder had lower mean ranks than the comparison group (Anxiety; yes, 531.07, no, 622.45, Stress: yes, 523.80, no, 623.16). Those who believe they have some "other" disorder demonstrated lower anxiety and stress scores (Figure 25).

Figure 25. Percentage of Participants who Think they may have a Specific Mental Health Disorder



N=1238, Depression p=.06, Anxiety p=.011, Stress p=.006

Associations Among Depression, Anxiety, and Stress Constructs

All three sub categories of the DASS-42 (Depression, Anxiety, and Stress) were found to have a significant correlation to one another through Pearson correlations (Figures 26-28). There was a moderate correlation between anxiety and depression ($r=.634$, $p<.005$) and between depression and stress at $r=.689$, $p<.005$. There was a strong correlation between anxiety and stress at $r=.770$, $p<.005$. The coefficient of determination (r^2) for the relationship between anxiety and depression was .402, meaning 40% of the variance in depression scores can be predicted by anxiety scores in this sample. Similarly, the coefficient of determination of r^2 for the relationship between anxiety and stress was .593, thus 59% of the variance in stress scores can be predicted by

anxiety. The coefficient of determination of r^2 between depression and stress was .474, meaning 47% of the stress scores could be predicted by depression scores.

Figure 26. Association Between Depression and Anxiety on the DASS-42

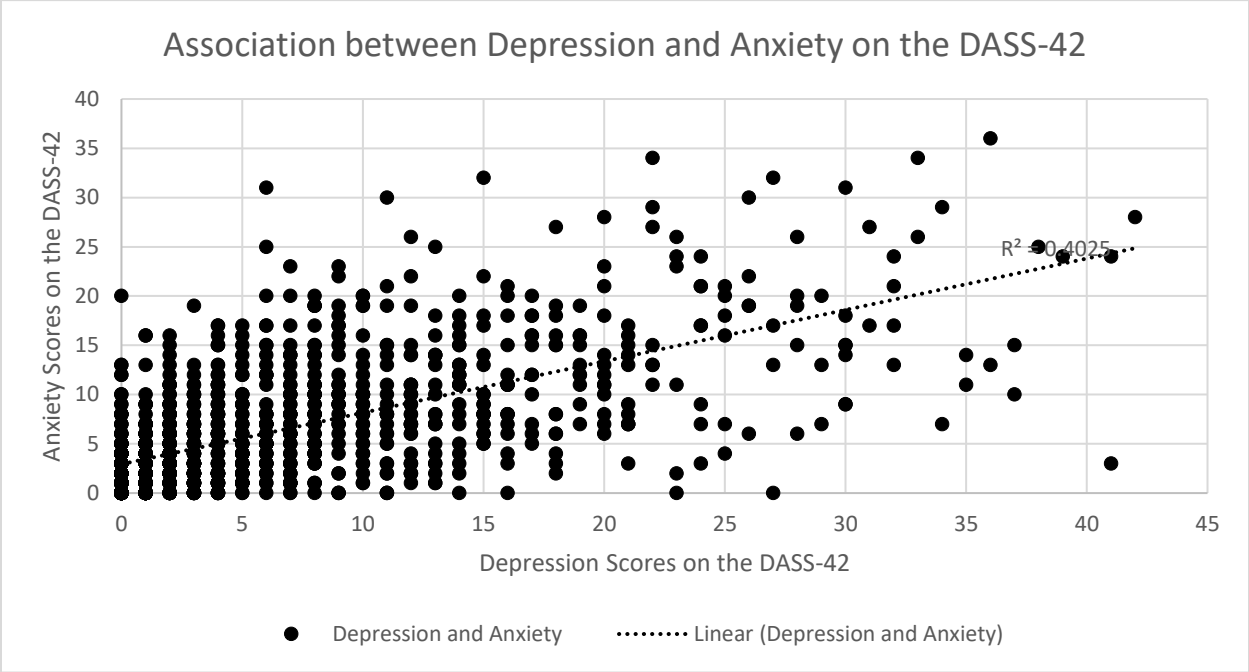


Figure 27. Association Between Anxiety and Stress on the DASS-42

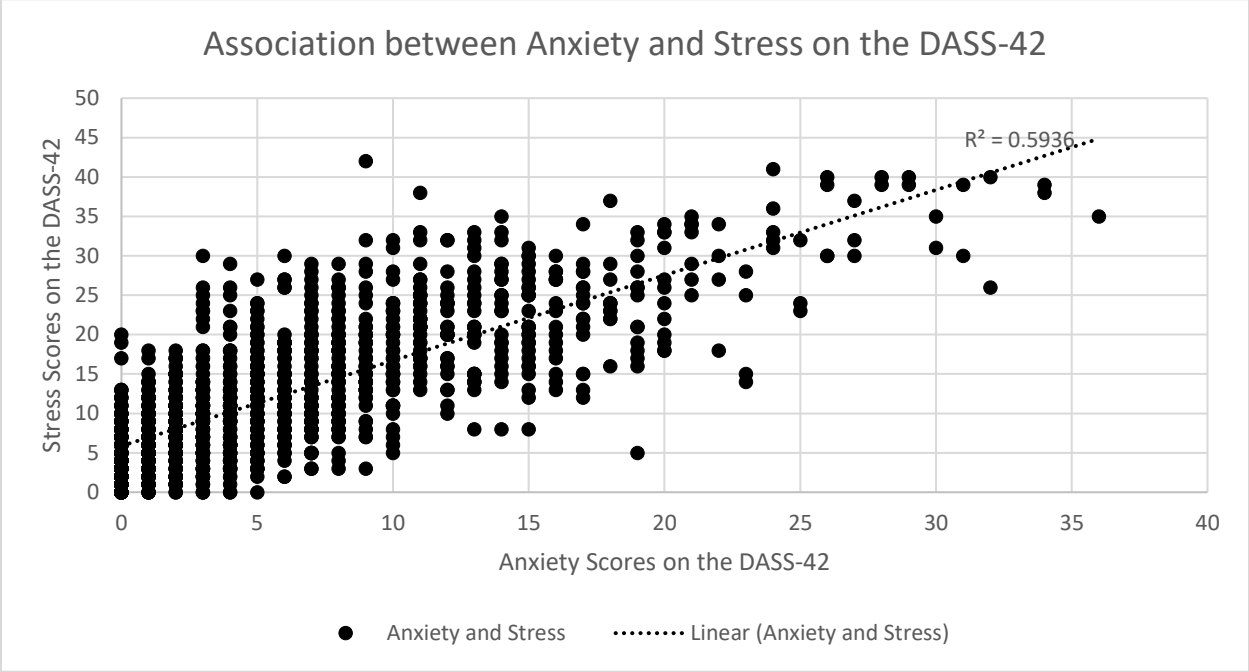
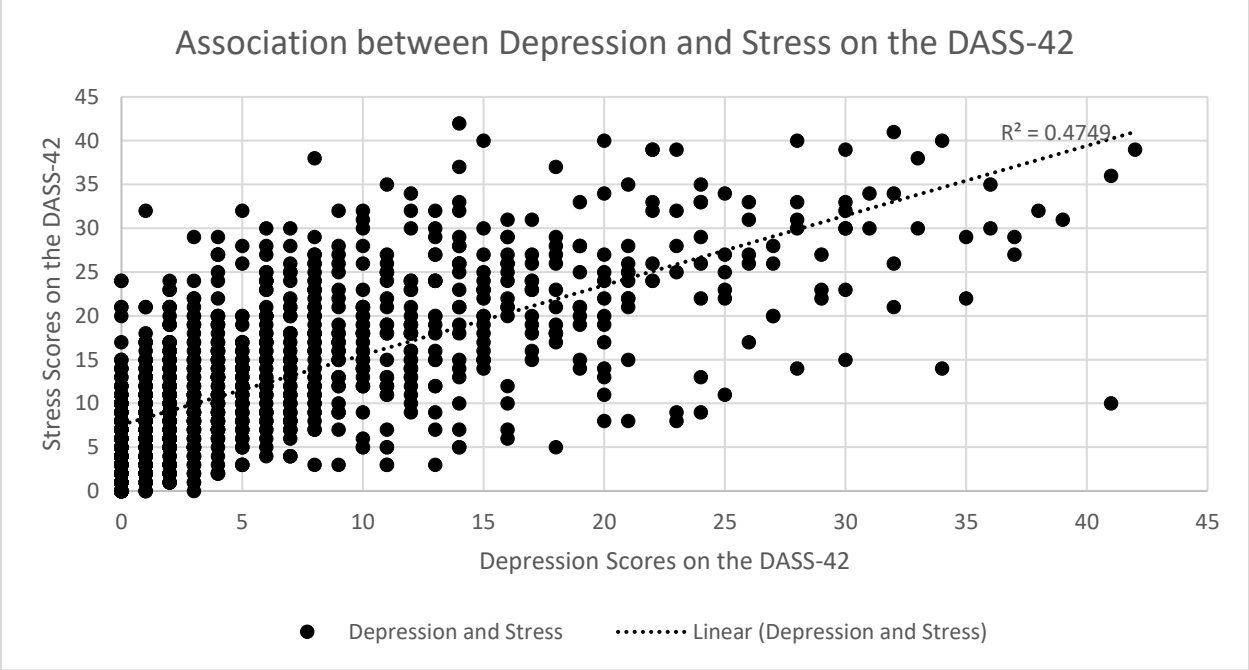


Figure 28. Association Between Depression and Stress



Associations between Depression, Anxiety, and Stress with Dichotomous Variables.

Point biserial correlations were conducted between dichotomous variables and the three constructs: depression, anxiety, and stress. When interpreting point biserial correlations, the sign (+ or -) is related to variable coding and is irrelevant to the results without further interpretation. Results from these correlational analyses are in Table 2. There was significant but weak correlations between several variables based on guidelines of Portney & Watkins.[114] For example, the correlation between gender and anxiety and gender and stress were significant, however the strength of the relationship was small at r = .099. In both cases, females were associated with higher anxiety and stress scores. A positive family history, diagnosis of a mental health disorder, taking medications for mental health issues, a history of trauma, and the use of support services were all significantly correlated with higher depression, anxiety and stress scores, however the strength of relationship was weak. There was a moderate correlation for those who believed that they had been diagnosed with a mental health disorder. For the presence of chronic disease, only anxiety was significantly correlated, with higher scores found for those with a chronic disease (Table 5).

Table 5. Associations between Depression, Anxiety, and Stress with Dichotomous Variables.

Variables	Depression Scores		Anxiety Scores		Stress Scores	
	Correlation (r_s)	Significance value (p)	Correlation (r_s)	Significance value (p)	Correlation (r_s)	Significance value (p)
Gender	-.004	.893	.099	**.001**	.117	**p < .005**

Family History	-.184	**p < .005**	-.204	**p < .005**	-.222	**p < .005**
Diagnosed Mental Disorder (yes/no)	.190	**p < .005**	.211	**p < .005**	.228	**p < .005**
Believe you have a Mental Health Disorder (yes/no)	.259	**≤.005***	.249	**≤.005***	.299	**≤.005***
Taking Medication (yes/no)	-.21	**≤.005***	-.24	**≤.005***	-.20	**≤.005***
History of Trauma (yes/no)	-.20	**≤.005***	-.24	**≤.005***	-.20	**≤.005***
Use of Support Services (yes/no)	-.24	**≤.005***	-.23	**≤.005***	-.23	**≤.005***
Chronic Disease (yes/no)	-.05	.071	-.09	**.002***	-.06	.055

*Indicates significance

Associations between Depression, Anxiety, and Stress with Ordinal Variables

Spearman non-parametric correlations were used to compare the relationships between ordinal variables and the 3 constructs of depression, anxiety, and stress (Table 3). When interpreting Spearman correlations, the sign (+ or -) is related to variable coding and is irrelevant to the results without further interpretation. There was a significant correlation between age and depression, with older students having higher depression scores. As students moved through the DPT program, levels of depression, anxiety, and stress decreased, whereas regarding GPA, as GPA decreased, depression, anxiety, and stress scores increased (Table 6).

Table 6. Associations between Depression, Anxiety, and Stress with Ordinal Variables

Variables	Depression Scores		Anxiety Scores		Stress Scores	
	Correlation (r_{pb})	Significance value (p)	Correlation (r_{pb})	Significance value (p)	Correlation (r_{pb})	Significance value (p)
Age	.081	**.005***	.004	.882	.055	.055
Years in DPT program	-.075	**.008***	-.109	**≤.005***	-.088	**.002***
GPA	.175	**≤.005***	.126	**≤.005***	.141	**≤.005***

*Indicates significance

Qualitative Data

The purpose of the qualitative portion of the study was to describe the lived experience of DPT students who self-identified as having a mental health disorder via the DASS-42 which was administered during their graduate program. This sample was made up of 20 DPT students in varying years of their program. Students were included if they scored in the moderate or higher range in at least 2 out of the 3 constructs of the DASS.

The majority of participants for the qualitative part of this study were female, with the highest number of participants from the southeast and southwest regions. Seventy-five percent of those interviewed were between the ages of 20 and 25. Half of all interviewees scored at least moderately high in all three categories on the DASS-42 with 90% of all participants including anxiety in their profile (Table 7). Names used in Table 7 and for quotations are fictitious and indicate gender only.

Table: 7 Interview Participant Data

Pseudonym	Age Range (years)	Gender	Number of Years in Program	Geographical Region	Moderate-Severe Scores on DASS-42
Lisa	20-25	Female	3	NE	A, S, D
Barb	20-25	Female	3	NE	A, S
Tara	20-25	Female	2	NE	A, S, D
Chris	20-25	Female	Not Known	NE	A, S
Marge	20-25	Female	2	SE	A, S
John	31-40	Male	2	SE	A, S
Jess	26-30	Female	3	SE	S, D
Stacy	26-30	Female	3	SE	S, D
Leah	20-25	Female	1	SE	A, S
Lois	20-25	Female	2	SE	A, S, D
Becky	20-25	Female	2	SE	A, S, D
Tom	20-25	Male	1	NW	A, D
Lena	20-25	Female	2	NW	A, S, D

Chris	20-25	Female	2	NW	A, S, D
Casey	20-25	Male	2	SW	A, S, D
Sam	20-25	Female	1	SW	A, S
James	26-30	Male	3	SW	A, S, D
Jewel	31-40	Female	2	SW	A, S, D
Jane	26-30	Female	4	SW	A, S
Beth	20-25	Female	3	SW	S, D
Amy	20-25	Female	3	SW	A, S, D

A = Anxiety, S= Stress, D=Depression

Through an inductive process of theme generation, 4 major themes emerged from this data. These ideas centered around resource utilization and support systems, as well as primary challenges to their experience as students. The 4 themes that emerged from the qualitative analysis were: 1) When Accessing Resources Becomes a Stressor, 2) Seeking Support from Trusted Confidants, 3) Perceived Expectations & Challenges During Professional Education, and 4) Striving For Perfection. These themes and their sub-themes are illustrated in Table 8.

Table 8: Theme & Descriptors

Themes	***Descriptions***
THEME 1: WHEN ACCESSING RESOURCES BECOMES A STRESSOR	*Avoidance of or lack of following through with professional or university resources due to the stress of adding more obligations.* *Accessing formal mental health services created additional stress and anxiety by means of financial constraints, limited assistance, and lack of knowledge of resources*

<u>THEME 2</u>: SEEKING SUPPORT FROM TRUSTED CONFIDANTS	*The primary resource students shared these private matters with was a close friend or family member. In addition they sought assistance from professors they felt connected to.*
<u>Sub-Theme 1</u>: Leaning on Friends & Family	*Perception that those who knew them (close friends and family) were trusted confidants who would not judge them.*
<u>Sub-Theme 2</u>: Leaning on Genuine and Empathic faculty	*Non-judgmental interactions, genuine concern for the individual, open/honest communication, and the willingness to self-disclose lead to connectedness and trust.*

<u>THEME 3</u>: PERCIEVED EXPECTATIONS & CHALLENGES DURING PROFESSIONAL EDUCATION .

Theme 1 – When Accessing Resources Becomes a Stressor

Most students who sought private psychologists and/or counselors acknowledged a diagnosis prior to graduate school and had a pre-established professional resource. Many students discussed their experience with professional resources, both through the university and privately. However, for all students who sought professional help, it was explicitly stated that accessing this resource was, itself, stressful. Students explained the anxiety produced by having to schedule another appointment, having to make time for this type of self-care, and balancing this with other demands on their time. One student described her challenges between managing her young family, school, and attempting to schedule time to meet with the university counseling center.

> *I've tried to see counselors because that is a free service that the university offers and unfortunately it, it never got into a good pattern of, this is what I do on Tuesdays. Either because somebody got sick or there was an exam or there was a snow day, or I just couldn't muster up the energy to do one more thing that day. The problem that I ran into was that I was already feeling overwhelmed and struggling to manage everything and then jumping though these hoops became one more thing that felt overwhelming. It was hard to manage." (Lisa)*

Other students expressed similar concerns and frustration over the issue of time management. John explained this frankly when he stated, *Seeking outside treatment always seemed like a time consuming thing. I just felt like I didn't have time.* Making space in their schedule for treatment was perceived as the need to forgo other obligations, and many students weren't willing to sacrifice the time. In fact, the addition of another obligation appeared to be counterproductive to reducing anxiety and stress as Casey explained.

> *I think one of the main reasons I haven't, um, pursued more formal (assistance)…is, honestly just my schedule. I feel like having to schedule in another appointment and make sure my schedule is clear for that*

> *appointment that would add more anxiety to me, add more to my schedule. (Casey)*

In addition to the pressures of time commitments, students also expressed concerns regarding finances, limiting some students from accessing private therapy or counseling. Jewel, a 2nd year student stated, *I can't go see my therapist as often as I'd like because I am paying out of pocket and I am broke because I am in school.* It was also noted that despite the fact that university services were free, they were not unlimited and did not appear to provide the totality of support and resources that private counseling might provide. The following describe how students experienced these challenges.

> *I'd heard…um, not so great things about the, um, resources on campus like, just not being very consistent or helpful. I know it's only free for a certain amount of time so…just not worth it. (Sam)*

> *The school wanted to help so they brought the school counselor to kind of talk to us about how we are dealing with this [a tragedy] and how we can help support her [their peer] but it was kind of too little, too late. The timing was awkward. (Jewel)*

Adding to an already full schedule, balancing counseling as an additional demand, and the potential financial strain made the use of professional resources challenging for these students. With respect to university resources specifically, some students noted difficulty with scheduling due to limited hours, while a few said that they had used the university resources infrequently, but effectively. A few students verbalized negative experiences with the available resources, explaining that the advice they were given was not helpful, and that they were discouraged by the limitation placed on the free service. Others felt that they needed a higher level of assistance or just preferred to seek treatment outside of campus.

Several students stated that their program had mentioned counseling services during orientation, but then rarely re-visited this idea, so their knowledge of what was offered was not sufficient. Often students verbalized that they thought there were resources, but they were ambivalent about the details. When asked if his university offered resources, Chris explained: *I think so. I haven't really looked into it just because I'm a grad student, so things aren't advertised to us, but I think there are. . . like people you can talk to within the university.*

For some students, the idea that mental health was not promoted or well understood was concerning to them. This idea suggested that students believed, as healthcare providers, there should be an openness to and awareness of the impact of mental well-being. Barb explained this as an irony for the profession of physical therapy: *I don't think the program does a good job at promoting mental health, which I think is interesting because we are health professionals. (Barb)*

Resource utilization faced many challenges as perceived by graduate students in DPT programs. The interviews brought forth concerns regarding balancing appointments with an already very demanding schedule, financial constraints, limitations on the depth of assistance provided, and lack of knowledge regarding what support was available.

Theme 2 – Seeking Support from Trusted Confidants

If students weren't utilizing the university resources, then to whom were they talking? What support systems did DPT students utilize when experiencing mental health issues? To understand their choices, students were asked to describe their most utilized resource regarding getting help or support for their mental health concerns. In addition,

they were probed to describe the reasons for seeking this resource, as well as reasons they may not choose others that were available to them.

Despite the individual or individuals mentioned as being a support system for the student, the commonality shared by all students was the desire for a sense of trust, centering around those who were familiar to them. They also sought individuals they perceived as non-judgmental, and those who were genuine and open about their own experiences. There were 2 sub-themes derived from the data. The first theme describes the primary individual whom students sought out for assistance. The second theme highlights the characteristics of faculty members to whom students felt they could be open with. The primary focus surrounding each of these choices was that of trust. The need for open and honest relationship building is more heavily discussed in the sub-theme involving faculty.

Sub-Theme 1- Leaning on Familiarity

The majority of students chose someone close to them as their primary support system, although a small number of students did report preferring professional resources over friends/family. Most often, students reported a family member or very close friend, describing a feeling of safety and openness with this person. Threaded throughout this conversation was verbiage that described the feeling of being understood, freedom from judgment, and a sense of overall comfort. The following excerpts highlight this sentiment.

> *To me that's really helpful to have someone that they can kind of put themselves in your shoes more than most people, so to me that's like one of the reasons my friends are kind of my go-to's… because they understand that they've also seen me at my worst which can be scary for*

> *some people I guess. It can be hard for some people to see and understand, so I think that's kind of the main reason they are the people I'm comfortable with. (Tom)*
>
> *I would have to say that it is (pause) my biggest support is my husband and children and another huge support is the people I went through the program with. I'm comfortable enough with them to say I'm not okay and this is what is going on. So, for me the emotional support and the friendship support is what's really gotten me through. (Lisa)*

Students generally seemed to feel the most comfortable with someone close to them, someone who knew them, and someone they trusted. This comfort appeared to stem from a place of feeling understood and freedom from fear of judgment. Becky discussed how she felt about talking to people outside of her inner circle. She expressed concern regarding how knowledge of her mental illness may change others' perceptions of her explaining, *I'm scared they are somehow going to put this toward how they treat me.* Another student expanded on this fear in some detail by explaining how some of his behaviors were often misinterpreted by others, making it difficult for him to be open with his peers.

> *In some sense I think some people get the wrong impression that I'm a quiet person or like I kind of always seem tired or down, like that I don't sleep and things like that and sometimes it's not in my control to a certain extent. (Tom)*

Intertwined with this fear was also the perception that others expected them to self-manage and that they didn't want to be a burden to others. Leah stated, *I don't want people to worry about me because I feel like I should have this under control at my age.* Participants' concern with being misunderstood and judged for their mental health issues carried over into other themes as well.

Sub-Theme 2-Leaning on Genuine and Empathic Faculty

In addition to friends and family, students often reported reaching out to a faculty member in their program. Students were asked as to describe that faculty member who was a trusted member of their circle and therefore, had been a support to them during their program. Because faculty are often present in the lives of students on a weekly, and often daily basis, it was important to understand the role that faculty play, especially with respect to mental illness. During the interview, students were asked to either elaborate on the faculty member that they openly talked with regarding their mental health, or they were prompted to think about their faculty and to describe the individual who they would be most likely to be open with and why. If answers were vague, they were asked to describe the characteristics a faculty member to whom they would confide in.

Students described these faculty as open, honest, compassionate, and kind. However, the most consistent themes that emerged from the narrative about faculty were that of self-disclosure and genuine interest in the student as an individual. Many of the students interviewed discussed feeling closest to faculty members who disclosed some details about their own life. This included openness about their families, their own struggles, their own beliefs, and even their own challenges with mental health. Students made comments such as, *I can tell they are dealing with stuff in their lives too, or they are making mistakes and they are willing to admit it.* (Jane) John described the openness of a specific faculty member as follows;

> *She is very open about her own struggles with some mental issues. The way she talks about things and you know she is very open about her own umm struggle with some mental issues. Like, she said she has ADHD and something else I can't remember, but she is very open about it. And she talks about how her brain is broken all time (laugh), so I mean, I felt*

> *drawn to her. I felt like she could identify with me. and she is also just an outside the box kind of thinker. She, you know, I feel like anything that was different in any way, she would not see as different. She would see it as special. And so, I shared that with her and I got the exact response I was thinking. She's been very helpful and very supportive. (John)*

It also seemed important to students to know that faculty experienced challenges during their own academic journey. Stacy explained how this impacted her ability to be open with a specific instructor when she said, *We got comfortable talking with him because he talked to us about how he did going through PT school.* A couple of students also discussed how meaningful it was for faculty to be open to the cognitive-emotional aspects of their academic journey. Lisa explained this in terms of a faculty member's research and area of expertise:

> *I think I felt comfortable with the faculty member that I reached out to because she was doing work on emotional intelligence, and she just said some things in class about when she went back to get her PhD and her struggles she had with that.*

In addition to appreciating self-disclosure, students often commented that these professors showed genuine interest in the details of students' lives. They expressed feelings of being seen and noticed for the person that they were, not merely their performance in school. Students described these faculty as individuals who would demonstrate interest by asking specific questions about their lives, going out of their way to sit down with the students after class, and making an effort to know more about the depth of each one of them.

> *She really does care and will ask questions like, not just how is school, but how are you doing? Have you taken time for yourself? She kind of asks those questions about your well-being. (Chris)*

Several students' comments articulated the power of being seen as a person rather than just a student. Lois stated, *She seemed so interested where we are all at in our personal journey.* Another student echoed this when she said, *She likes to get to know things about each of us. She likes to talk to us about things that aren't PT school.(Tara)* Leah echoed this when she said, *They were able to like show us and help us realize that we are also human beings as well as students.*

Disclosure and genuine interest created a humanness that seemed to be the bridge allowing students to be open and vulnerable enough to admit that they were struggling and needed help. When asked to describe the faculty characteristics that would dissuade them from being open and honest, students expressed ideas related to defensiveness, judgmental attitudes, and authoritative behavior. In addition, some students referenced the generational difference by stating that a professor displayed antiquated approaches, or that they found it easier to be open with younger faculty members. The table below highlights comments that were made with respect to both faculty whom students felt were approachable and those faculty who they did not feel were approachable. These were adjectives noted in addition to the theme of self-disclosure (Table 9).

Table 9: Adjectives Describing Approachable and Unapproachable Faculty

Student Comments Regarding Faculty Who Were Perceived as Approachable	Student Comments Regarding Faculty Who Were Not Perceived as Approachable
Sincere (Casey)	*Defensive (Lisa)*
Accepting, No Judgment (Lois)	*Old School Mentality (John)*
Welcoming (Jess)	*Judgmental (Becky)*
Helpful, Supportive (John)	*Closed Off (Chris)*
Genuine (Becky)	*Condescending (Amy)*

Although this research did not explicitly explore generational gap issues, there was evidence that supports further investigation in this area. For example, one student explained that she felt drawn to the younger faculty because she sensed that they were able to better relate to her experience.

> *They're [the faculty member who I feel comfortable with] one of like, the younger people on the faculty. So I feel like I relate more to them and they also went through this program in particular, so they're really good about like, telling everyone like, it's going to be ok, you're going to get through it and you know they actually understand because they went through it not too long ago. (Sam)*

Some students also commented that they felt closer to faculty when they were on a first name basis and when the faculty assumed more of a mentorship/peer role rather than a hierarchal one. Students generally felt that professors who established very solid boundaries of the teacher-student relationship were more difficult to be open with. Tara described these faculty members as those who made it more like a competition rather than a learning experience. She went on to describe how the hierarchal attitude impacted her perception*, It's very in your face and it's not one . . . it's not a person to person relationship. It's an, I'm above you, you're below me kind of relationship.*

The overall theme that was articulated regarding the perceived expectation of faculty by students with mental health concerns was the need to feel validated by and connected to those who were in this experience with them. This was expressed in terms of non-judgmental interactions, genuine concern for the individual, and open, honest communication. Each of these concepts appeared to contribute to the ability to build a meaningful relationship, fostered, ultimately by trust.

Theme 3- Perceived Expectations and Challenges During Professional Education

One of the topics discussed in each interview was the difference between the undergraduate and graduate experiences. All students interviewed perceived a significant change between the experience of undergraduate to professional studies. All students explained this difference in terms of elevated personal and academic expectations during the graduate experience. The concepts included: emerging adult responsibilities, intensified academic rigor, and an overwhelming fear of failure. The sub-themes of adulthood expectations, the challenge of balance, fear related to a high-stakes environment, and the influence of perfectionistic tendencies combined to provide an overview of the lived experience of these students.

Three sub-themes emerged beneath the major theme of "expectations and challenges of professional education". They are related to emerging adult responsibilities, difficulty with balancing new demands, and a fear based response to elevated stakes. Together, they combine to create the overall theme that describes the significant changes experienced by students in a professional program.

Sub-Theme 1- Growing Up in Graduate School

Every student interviewed expressed how different graduate school was from their undergraduate experience, and each discussion expressed the same general consensus; graduate school was far more stressful, the expectations greater, and therefore the fear of disappointment much more apparent. Most students followed this by indicating that a fear of impending failure was not present for them in their undergraduate education. Casey stated, *There is not a year of undergrad that matches a semester of PT school.*

Students reported that the biggest difference was the academic rigor, including workload, the intensity of the material, and the expectations. For many students, the need to alter their approach to learning and consuming information was difficult and stressful. Amy noted, *I had to change how I studied, the way I took in and consumed information that was given to us [in grad school]*. In addition, the change in expectations was altered by the intimacy of the graduate program, placing a greater onus on student performance. Beth stated, *Expectations are higher. In undergrad, the faculty didn't really know you, and so it was hard for them to have any expectations of you.*

There was also the sense that the curriculum change required much more than most students were used to in the past. They frequently talked about undergraduate courses being "easier" and that they were able to manage just by paying attention in class or with minimal studying. Several students admitted that in undergraduate courses, they were able to perform at a very high level without much effort. They referenced things like, making a B or a C for the first time in their lives as being somewhat traumatic. Most, if not all, students expressed this change as a major shift in their approach to their academics. One student expressed this perception very clearly.

> *It's been a very requiring program . . . It has been a lot of course work that requires a lot of studying and a lot of paying attention while you study. There really hasn't been any, I don't want to call them blow off classes, but classes that don't require a high level of engagement. (Lisa)*

In addition, students expressed stress over the changes in adult expectations that naturally occurred given their general age. They felt that the life changes such as buying a house, getting married, and having children, created more external pressure than they were used to. For example, Jane explained her experience: *In grad school, trying to*

grow up, own a house, and get married, and all that kind of stuff. There have been a lot more external stress factors. Although this theme was heard in almost all interviews, it appeared to be elevated for students who considered themselves to be non-traditional. Non-traditional students are addressed in a later theme.

Overall, both the internal demands of physical therapy school combined with the new external expectation of emerging adulthood appeared to create a level of stress that these students had not yet experienced, nor for which they felt ready. In addition, the expectations that students had of themselves based on their past successes may also have played a role in their perception of the differences in the graduate versus undergraduate experience.

Sub-Theme 2- The Challenge of Balance

To understand how students perceived the way in which their emotional disorders and/or symptoms impacted their graduate experience, students were probed about the challenges they faced, the influence of mental illness/wellness on relationships, and the impact that these factors had on academic standing. It is important to note that all students interviewed, without exception, either used the word "balance" or a similar word or phrase, such as "managing everything," when asked what their greatest challenge has been. Throughout each of these interviews, the struggle to balance the demands of life and school were noted. Through these responses, students divulged significant data that may help to provide insight into their lived experience as a student with a mental health disorder, and the challenge that maintaining balance presents.

The most prevalent challenge discussed by almost every single student who was interviewed was that of balance. The struggle to balance family, school, work, friends,

and self-care was consistently expressed throughout each interview, similar to Sam's description: *The main one [challenge] would be balancing all the school work with anything else, whether it's exercising or doing stuff with like, friends and family.*

For some students, there was an additional sense of loss noted, in that they had to give up the people and the activities they were accustomed to in order to manage this new demand. An underlying assumption appeared to be that students needed to give up their life outside of school in order to keep up with the change in intensity level of the program. This appeared to be overwhelming and disruptive to not only school, but also relationships. Chris and Becky explain this in terms of their experiences:

> *Trying to find that balance between school and like life and social life and all that because you're kind of bombarded with all of this content so you really can get carried away with just focusing on school but then just kind of the stress of it all will kind of hit you and then you're like I need to take a break and I need to actually you know enjoy life a little bit outside of PT school. (Chris)*

> *You kind of have got to give sacrifices whether it is to some friends, to keep relationships with a boyfriend or a girlfriend . . . um . . . and then you know, to keep a relationship with your family, it's a whole other time-consuming effort. (Becky)*

The challenge of attaining balance seemed complicated by the fact that the commitment to school may not have been well understood by their families and friends. Jewel was a first-generation student and noted that her parents and friends did not fully understand the commitment to a professional graduate program.

> *So, it was hard for me to get my family and my fiancé and everyone on board to understand the commitment that it took for me to get good grades and try to understand the material. So, it was really hard for me to have to say no to all the family functions if my studying ran into the weekend and I*

> *had to study on Saturdays and Sundays. Say no to church, say no to things I wanted to do and for them to understand that I wasn't doing it out of, umm, like selfishness, but it was something that I had to do because it took me a long time to read a chapter or this textbook was really hard to learn. (Jewel)*

Balance also seemed to be an exacerbated concern for those students who considered themselves to be non-traditional (such as being older than the majority of their cohort or having to care for family members). At least 2 of the interviewees noted that they had young children, or were older than their peers, making them feel somewhat separated from the rest of their cohort. Jewel, who was greater than 10 years older than most of her classmates stated, *I don't have the same bond with my classmates. They have all had the opportunity to spend a lot of time together.* In addition, older students with family obligations felt even greater pressures to balance out the needs of themselves and others who were depending on them. Lisa noted how this struggle tested her sense of self and duties to her family.

> *It's been very difficult to work out between not getting any sleep, children who want me to put them to bed, and then you know, class requirements. I feel like it's a juggling act, and I have never quite been able to get it. You're kind of set up with a baseline of your self-awareness and your wellness and graduate school pushes against that . . . physical therapy school pushes against that really hard.(Lisa)*

In addition to work-life balance, students also stated that finances were a major challenge that was tied to lack of balance. Not only was this a concern about current finances secondary to inability to work, but also the fear of wasting the tuition if they were not successful in the program. When asked about his greatest challenges, James commented, *It's the amount of student loans, like the financial aspect, and not being able to work.* Students frequently referenced loans and lack of income as stressful aspects of

being in the physical therapy program. Other challenges noted were acclimating to the elevated intensity level of the academics, uncertainty about their career choice, and lack of time for self-care, such as healthy eating, sleeping, and exercise. Almost all of the difficulties noted appeared to be linked to challenges with time management in balancing demands.

Sub-Theme 3: When the Stakes are Higher; Fearing the Fall

The question to participants regarding challenges triggered unprompted discussions about fear. Fear and challenges were separated in the coding method by defining a challenge as something a student considered to be *external* to themselves, while a fear was defined as something that the student felt or developed *within* themselves. The most overwhelming fear was that of failure. All students expressed fear of: failing out of the program, wasting funds spent on education, disappointing their families and professors, providing a wrong answer, or of letting patients down in the future. This all seemed to be linked to the perception that the stakes were now higher and the cost of failure greater. Lois voiced feeling this pressure on a weekly basis.

> *I took several loans to get this education, and I never know after exam week if I'm going to be able to save my spot in the program. I'm always worried, am I going to be able to stay in the program? Can I make the grade? Am I going to do well enough? Can I make the grade?* –Lois

Some students discussed anxiety of openly answering questions in class for fear of being wrong. They described this as a true barrier to their focus and learning environment. Barb explained how this fear disrupted her everyday learning experience: *There were times in a class where I couldn't pay attention or learn because I was so afraid I would be called on to answer a question that I didn't know the answer to.* Some

students catastrophized their fears, sensing that failure of an exam may ultimately lead to failure as a professional. Although most students perseverated on the current possibility of failure (the exam, the course, etc.), many verbalized the overwhelming concern of never actualizing their dream of becoming a physical therapist. When Tara was speaking, there was a sense of defeat in her voice when she stated, *You're gonna fail, you're gonna fail out of the program, and you're never gonna get your license.*

The overall theme of fear was apparent in every conversation and appeared to be at the core of every experience of the students. These students referenced some type of anxiety related to fear on a daily basis, most frequently during exams or practical exams. The external expectations and the large financial commitment also appeared to contribute to the fear of not only failure in the program, but of not performing at the high level to which most students were accustomed. In response to this, students explained how this fear drove their perceptions of judgment and ultimately their ability to achieve academic success despite having serious mental health challenges.

Not only did students feel that the stakes were higher, but they also made assumptions about how their mental health disorder would be perceived by others, namely professors and peers. Students expressed fear about discussing mental health as they felt that it was still associated with stigma, fear, judgment, and burden. Often, they would state that they were fearful that knowledge of their disorder would influence the way they were treated in the classroom and that it may change the image that professors had of them or their capability to handle the challenge of graduate school, thus potentially leading to failure. This fear led to the common behavior of masking their issues or intentionally hiding their symptoms. One student explained that secondary to the typical

nature of graduate students, it was very possible to conceal the symptoms to avoid failure. In fact, often, the student could be so high functioning, the struggle would go undetected by others. Beth explains this well;

> *So, I think that in anything, especially in a graduate program that is so competitive to get into, that a lot of people who struggle with anxiety, depression, or whatever it may be, are probably pretty high functioning still. So it could be the best student in the class who is having really severe issues with mental health and no one would expect it. (Beth)*

Students also reported that revealing this struggle would lead to vulnerability. They stated that they would not divulge their issues due to the potential interference with their academic progress. Students explained that they believed their disorder and/or symptoms were not visible on the outside, so there was no reason to reveal their issues to anyone else, as one student stated:

> *It's not really noticeable outside of my own brain. Putting it out there would make me, I don't know, vulnerable to some sort of stigma or judgment or something. I'm able to internally manage it well enough by now since I've had it for about half my life. But you know it's not really noticeable outside my own brain. (John)*

Becky felt similarly and explained how divulging this challenge may alter how she was being viewed as a student. She stated, *I'm scared that they are somehow going to put this towards how they [professors] need to treat me, that I will be judged academically based on my issues somehow.* In addition to the attempts to mask their symptoms and struggles from their professors and peers, students also verbalized the desire to hide it from their families as well. Sometimes it was based on a family value, as in the following example. For Casey, the self-management of mental health was a given

expectation. He stated, "*I was very much raised in a household where we deal with it ourselves."*

But for some students, it was a means of avoiding disappointing their family members. Jane reflected on how this behavior actually changed her, once close, relationship with her parents.

> *My personal relationships [were impacted], especially my relationship with my parents because they are asking questions about school and about how I'm doing and it's not like I'm lying to them, but it's definitely trying to cover up the truth, like I'm struggling with this, this, and this. (Jane)*

Students expressed a significant sense of risk associated with the potential for failure in their professional program. They described the perception that the graduate environment elevated the expectations and that the consequences for failure were high. This perception elicited a fear response in several situations where "failure" was possible, and this fear appeared to permeate the entire academic experience for these students.

Theme 4- Striving for Perfection

The theme of perfectionism was heard throughout most of the interviews. It was often intertwined with other concepts such as fear, comparison, and a sense of inadequacy. Students seemed to express that the expectations of themselves and others were never high enough. There was a common thread of ideas that centered on the perception that their peers were all succeeding, and they themselves were falling behind. In addition, there were many comments made regarding performance, whether it was during class, an exam, or a practical. For a few students, the fear of answering a question incorrectly was equally as disturbing as the fear of failing a major exam. The internal

and external pressure to excel, become, and prove themselves was a major concept that evolved from the interviews.

Students described the sense of pressure to achieve and perform. There was a consistent perception that their efforts were never enough, and that there was no room for failure merely by the nature of the doctoral program, as Jewel explained, *I struggle a lot with feeling like I have to be a straight A, perfect student because it's a doctorate program.* They often compared their efforts to their peers, and some of their comments resonated with the idea of imposter syndrome, an internal sense that one is pretending to belong, and that belonging to a specific group is underserved. [115] Amy's comment reflected this well;

> *We're all smart. We're all the cream of the crop, so when you are on the lower part of that, you feel like you're just floating by. You feel like, maybe I'm not that smart. Maybe I'm not good enough to do this.*

The idea of inadequacy was heard across several of the interviews, and at times, seemed to define who the student felt they were. This was also true of Lois' experience:

> *I just feel, um, helpless, and I get anxious and I feel often times, inadequate…that I can't match up with my classmates, and I kind of get into my own head and create scenarios that are not realistic . . . and you know, being afraid of the failure of the exams . . . that kind of shapes my entire mindset. (Lois)*

Competition and comparison were often associated with the perceived need for perfection. Students continually compared their academic efforts with those of their peers and made assumptions about one another's success. This created a sense of defeat and sometimes created the assumption that they were always falling short. Tara explained this as, *the expectation that everyone else is on top of their work all of the time and that you're most likely behind everybody else and it feels like everyone is doing more than you. In addition, some students felt that "everyone is in high stress mode." (Tara)*

This type of assumption coincides with the idea that students were often making assumptions about how they were supposed to behave, feel, and act under the new pressures of professional education.

Assumptions and comparisons led several students to discuss the sense that they were never quite measuring up. Many of the assumptions that students made were negative, alluded to heightened stakes, or demonstrated a sense of inadequacy as compared to their peers. The sense that the stakes were higher saturated quickly during data analysis. Students described higher stakes as being a greater cost associated with failure – large amounts of time, effort, and money potentially wasted, inability to actualize the dream of professionalism, and severe disappointment to those who were supporting them. The sense that they had something great to lose, perpetuated assumptions that may have led to a need to avoid failure or strive for perfection. The following chart highlights several of the most impactful comments made by students that were coded under the title "assumptions." These reflect the suppositions made by students that may have led to the desire to strive for perfection in their professional studies (Table 10).

Table 10: Assumptions that May Perpetuate Perfectionism

Student Quotation	Student
There is always a competitive edge	Marge
I know I have to match up	Lois
Making sure you can live up to what you need to be doing	Lois
There's a lot more on the line	Casey
Sometimes it feels like the end of the world	Jane
It feels like this is the next step for the rest of my life	Amy
We're supposed to have it all together	Amy

Students also commonly noted that being accepted into the DPT program elevated the stakes in several ways, which in turn, appeared to elevate their drive for perfectionism. Interviewees discussed this in terms of both individual and social expectations. They, themselves felt an internal expectation to perform at a very high level. They also felt that their classmates, professors, and significant others expected success. They attributed this to the significant sacrifice of time, money, relationships, and self-care, which they felt must indicate a high level of importance for their school work. They felt that this was their *profession* on the line, and therefore, the only acceptable outcome was one of success throughout the program. These ideas were heard clearly in many student interviews. Tara explained, *I feel like there is such a push to be studying constantly and never take a break. There is a high expectation in the physical therapy program.* Casey also described the pressure, as well as how it impacted other

aspects of her life: *There's a lot more on the line, so you tend to put more efforts towards it. And, life outside of PT school doesn't stop, but in a way, we do. (Casey)*

The theme of perfectionism was the final to emerge from the data. Some of the perceptions that contributed to this theme were fear of failure, unrealistic expectations, a lack of control discerned by difficulty balancing new responsibilities, and the need to hide for fear of judgment and stigmatization. Perfection appeared to drive many of the comments related to how students viewed themselves compared to their peers, as well as how they felt about their own, personal expectations. Perfectionistic tendencies also appeared to drive the academic standing for 95% of the students interviewed. Of the 20 students interviewed, 19 reported no significant academic consequences during their program in the form of probation, failure of a course or of a clinical rotation. Based on the data collected, the driving force behind this phenomenon was at least influenced by an intense fear of failure and a need for perfectionism. Although the concept of academic grit and perseverance was not further probed, the data points to the fear of judgment and failure and the desire for perfectionism as emotional constructs that overshadowed the mental needs of the students regarding their course work.

Summary of Findings

The primary finding from the data was that DPT students were found to have higher DASS scores than their age-matched peers Depression $t(1227) = 10.76$, $p < .005$, Anxiety $t(1227) = 7.33$, $p = .005$, Stress $t(1227) = 2.91$, $p = .029$. In addition, first year students were found to have the highest levels of anxiety ($p = .001$) and stress ($p = .019$) of the 3 groups of students. Several variables were significantly correlated to with higher than average DASS scores which included medication use, history of trauma, use of

support services, 3.0 GPA or lower, family history of mental health disease, and a diagnosis or belief of a diagnosis of mental illness ($p \leq .005$), however many of these significances were relatively weak.

Four major themes and 5 sub-themes emerged from the interview data: *Theme 1- When Accessing Resources Becomes a Stressor, Theme 2- Seeking Support From Trusted Confidants (sub-themes: Leaning on Familiarity, Leaning on Genuine & Empathic Faculty), Theme 3-Perceived Expectations & Challenges During Professional Education (sub-themes: Growing Up in Grad School, The Challenge of Balance, When the Stakes are Higher-Fearing the Fall), Theme 4- Striving For Perfection.* The most common themes and those that appeared to most deeply define the overall experience were related to changes in expectations, difficulty balancing those expectations, fear of failure, and the perfectionistic nature of students, which may have contributed to their ability to achieve academically. The ideas of external expectations, fear of failure, and imbalance were heard most often throughout the 20 interviews. Based on this data, further research is necessary to provide more detail into experience of DPT students and to explore the possible causes and future impact of mental health disorders on the development of the professional physical therapist.

Chapter 5 – Discussion

Introduction

Students are experiencing high levels of anxiety and depression.[1,2,3] However, the lack of research that addresses students in graduate and professional studies creates a gap in the understanding of the magnitude of the problem. Graduate students tend to demonstrate an increased susceptibility to developing mental health disorders due to their age, life stressors, and financial constraints,[2] creating concern for faculty of graduate programs such as the DPT. However, the extent to which faculty should provide support and assistance is not well understood, nor do all faculty feel comfortably prepared to manage mental health concerns with students.[4]

Students suffering from moderate to high levels of depression and anxiety can experience subsequent decline in academic performance, thereby potentially impacting overall retention.[7] In addition, the presence of mental health issues and their related symptoms can negatively impact the student's physical well-being, interpersonal relationships, and cognitive health[2], which may have a detrimental impact on their lived experience during graduate school. This chapter includes a discussion of our findings compared to those of previous research studies, implications for DPT programs and the profession of physical therapy, recommendations for future research, limitations and delimitations, and conclusions.

Incidence and Demographics of Depression, Anxiety, and Stress in DPT Students

The primary findings in this study revealed that DPT students demonstrated higher depression, anxiety, and stress (DASS) scores when compared to their aged

matched peers.[102] Although the mean scores for this sample were within the normal range (based on severity levels), they were above the pre-established norms of their peers.[102] These findings are consistent with previous studies in the area of medicine and nursing, where graduate students demonstrated DASS scores that were higher than the established norms.[53,58]

In addition, a large number of students scored above the normal range for all 3 constructs, with a particularly higher score differentiation in the category of anxiety. These findings are similar to previous research that found anxiety rates to be higher than other mental health disorders.[116] In addition, the second highest severity ranking for all 3 constructs was in the moderate range. This finding was similar to several other studies,[53,55,58] and was highly similar to the Vanderbilt study,[55] in which approximately 25% of students were at least mildly depressed, and 43% of students demonstrated moderate to high levels of anxiety.[55]

According to the National Institute of Mental Health (NIMH), the highest levels of anxiety in 18-44-year olds are in females (23%) as compared to males (4%). Of those women with an anxiety disorder, 56.5% demonstrate moderate to significant severity levels.[116] Data from the current study is closely aligned with the Vanderbilt study,[55] in finding anxiety and stress levels of females, and the majority of those reporting a moderate severity level.

These high levels of anxiety may be attributed to some of the significant changes that are experienced during the transition to a first year graduate student, including separation from family and friends, family and personal demands, the elevated

expectations of graduate school, and on-going financial burdens.[2,118] However, this may not fully account for the sharp rise in anxiety, and other mental health disorders in students over the past 25 years. It is possible that the upward trend may also be related to broader societal influences. For example, there may be better recognition of mental health disorders, and greater acceptance of mental health challenges compared to 2 decades ago. There could also be societal changes in parenting strategies, such as parents hovering (helicopter parenting) contributing to higher levels of anxiety or decreased resilience of the young adult.[14]

Survey data also found that students demonstrated depression along with anxiety most frequently. This was not surprising since depression and anxiety continue to be the most common mental health challenges for both undergraduate and graduate students.[16-18] One finding that was surprising, however, was that there were no significant differences in the number of males and females who presented with depression. Previous research consistently found depression to be more common among females than males.[2,20,21] It is possible that the percentage of males with mental health disorders were over-represented in this study due to their exposure to mental health knowledge. It is also possible that males and females of this specific age group are relatively similar in their depression scores, as Hankin et.al describes, and that the gender gap is seen more globally due to the fact that depression has a tendency to reoccur in females more often than males.[117] Since this study did not evaluate longitudinal changes, the lack of gender significance may not have been captured.

There were also no significant differences in the incidence of stress, anxiety, and depression and the demographic variables of age, GPA, and geographical location of the

university. Given the small age range of participants and limited range in GPA, it is not surprising that there were no significant differences.

However, there were significant differences found between 1st year students and 2nd or 3rd year students, such that 1st year students demonstrated higher levels of anxiety and stress than 2nd and 3rd year students. This was similar to Jacob & Einstein, who also found 1st year graduate students to demonstrate the highest levels of stress.[61] The only other similar study to consider year in program assessed pharmacy students, finding 2nd year students to present with the highest anxiety levels.[8] There is not sufficient evidence in graduate students to understand why this disparity occurred, however, the pharmacy study derived data from a single institution, which may have impacted the overall results. That program, in particular, may have developed a more rigorous 2nd year curriculum that is not necessarily representative of the Doctor of Pharmacy students overall. Again, the results the current study suggest that this finding may be, at least in part, due to the significant changes perceived by students when they transition from undergraduate to graduate school.[2,118]

The impact of the first year of the DPT program as a year of transition was supported by the responses heard during the interviews with DPT students. Interviewed participants were very clear in their feelings about this transition, reporting a sense of elevated demands, time constraints, financial concerns, and fear of performance and failure. This is consistent with graduate students of other health profession programs.[46,47,48] Additionally, anxiety and stress scores decreased as students progressed in their respective DPT programs, which may suggest that acclimation to this transition may lessen mental health challenges such as anxiety and depression.

The Relationship between Mental Health and Academics

A strong relationship was found between the 3 constructs of anxiety, depression, and stress, demonstrating at least a moderate level of predictability of presenting with more than one of these constructs based on the score of another. This likely relates to the fact that anxiety, depression, and stress present with some similar symptoms, such as nervousness, irritability, sleep disturbances, and decreased concentration.[118] There is no clear evidence demonstrating causality between the constructs, however, there are many studies that have found depression, anxiety, and/or stress to co-exist in the undergraduate and graduate populations.[15,18,22]

Previous research proposes that mental health disorders, including depression and anxiety may negatively impact an individual's cognitive, and academic capabilities. Executive function, for example, is linked to judgment, memory, integration of novice ideas/concepts, strategy creation, inhibition, and managing feedback,[119] all of which are necessary to successfully complete a DPT program. However, this study revealed some interesting evidence to suggest that there may be factors that buffer the impact on executive function and concentration.

Both survey results and interview data revealed exceptionally high GPA's for this sample of DPT students, and although there were no significant differences in DASS scores between GPA categories, there was a moderately significantly inverse relationship between DASS scores and GPA. In other words, as DASS scores went up, GPA went down. This finding was not surprising as evidence clearly demonstrates the impact of mental health on cognitive function.[22] Studies such as the one by Andrews and Wilding,

concur that exam performance may be negatively impacted in the presence of mental health disorders such as depression.[24] It is also possible that as test scores and GPA decline, students experience greater stress, anxiety, and/or depression. This current research did not determine the causative relationship between grades and mental health disorders. Given the strong association between the 3 DASS constructs, this finding provides further evidence that depression, anxiety, and stress are likely to be associated with lower academic scores.

Interestingly, the survey data on academic performance was not aligned with the lived, academic experience data provided by the interviewees. During interviews, the majority of participants (95%), who were all at least moderately depressed or anxious, described no significant impact on their academic status within their program. In other words, these students had not failed a course, been placed on academic probation, or been removed from their program, despite experiencing mental health issues.

There are several reasons this may have occurred. First, this study examined a very specific group of students in a professional program. Overall grade point averages for DPT students must be high, with accepted students averaging 3.59,[22] and programs generally requiring an average of a 3.0 to remain in the program. This requirement may motivate and prime DPT students to prioritize their academics over their physical and mental health. In addition, the pre-requisite expectation may lend itself to students who are accustomed to maintaining high academic standards despite the mental health issues they may be facing. However, the fact that students may be accustomed to this high level of functioning does not necessarily account for their ability to over-ride the neuropsychological effects of mental illness on executive function.

The high GPA standard may also be skewing the interpretation of the GPA decline in the presence of increasing DASS scores. A falling GPA may not necessarily indicate a failing grade. In fact, since the average GPA is exceptionally high, a moderate decline may still keep the student from falling below the threshold for academic probation, thus explaining how GPA scores can fall, DASS scores rise, and yet students remain within the appropriate parameters for academic success.

Students and Support Systems

Participants in this study overwhelmingly chose to disclose their concerns to people who they viewed as their confidants, those they trusted to remain free of judgment and open to their needs. For most students interviewed, the primary support system was found in a close friend, peer, or family member, which drove the theme *Seeking Support from Confidants*. The survey findings indicated a significantly moderate relationship between students who were diagnosed with a mental health disorder and the use of professional assistance either via on campus or external resources. During the interviews, however, most students, both those diagnosed and undiagnosed with a mental health disorder, made the choice to seek non-professional resources. DPT students are generally between the ages of 20 and 25 years,[21] representing the millennial generation. Millennials are categorically more likely to engage with their family and friends more often secondary to their young exposure to technology.[14] This early exposure may contribute to their tendency to seek out those in their comfort zone first. Millennials also tend to exhibit higher rates of self-esteem than previous generations, which can often lead to high expectations of self.[14] These expectations may also influence a student's decision

not to "concede" to the idea that formalized assistance is necessary, as mental health remains a stigmatized perception by many students in this study.

According to university counseling centers, the percentage of students presenting with severe mental health issues in on the rise.[6] Additional plausibility for DPT students' decisions to seek friends and family as opposed to formalized support may be due to the severity of the impairment. Students may be more likely to access formal services when the condition is severe, and less likely if the severity is mild to moderate. Based on the results of this study, it is possible that the interview data captured more moderately afflicted individuals, impacting their support choice. This is important, however, since the majority of students reporting anxiety, depression, and stress symptoms in this study, fall within the mild to moderate severity level.

In addition, students described accessing professional resources as challenging, with the primary limitation being time management. The theme *When Accessing Resources Becomes a Stressor* was developed through the students' perceptions that additional appointments and commitments added to their stress and anxiety. This view may be a result of the fact that DPT students, primarily of the millennial generation, tend to over-commit, making it difficult for them to find time to integrate mental health care into their schedule.[14]

It is also possible that DPT programs continue to add more competencies to the curriculum, leaving very little time for students to attend to their own mental or physical health. As physical therapy programs fully transitioned to DPT degrees in 2015, curricular demands increased in terms of length, cost, and total credit requirements.

These additional pressures may be contributing to the students' sense of resistance to accessing more formalized resources because time and financial considerations are more challenging.

Students also discussed concern regarding the quality of the resources offered at their university. This was not a theme that fully saturated in the data, however, the fact that most students did not choose to use the university support may have impacted this perception. However, for a few students who had made an effort to take advantage of these resources, only a couple found it to be useful. The other students described the support as inadequate to meet the severity of their needs, lacking in the number and timing of sessions available.

Students also discussed unavailability of information regarding resources as a barrier. Several students stated that they were aware that services existed but did not know the location or how to access them. One possibility for the lack of information may be linked to the nature of graduate student life. Graduate students are less likely than undergraduates to gather in large common areas such as residence halls and study rooms,[18] making it less likely for them to see this type of printed information. This would imply that there is a responsibility by each program to provide this information early and often in order to provide university support as a true resource.

When asked about the programs and how they promoted counseling services, the majority of students stated that they had been made aware of such services, however this was typically during orientation or very early in their process, and that it was rarely visited again. One student indicated disappointment in efforts of her faculty to facilitate

the use of counseling or psychological resources. She described an inconsistency between the mission of a healthcare professional and the lack of mental health awareness promoted within the program. Although this study did not fully explore the availability of counseling resources within DPT programs, it appears that programs can do more to facilitate student awareness of and/or availability of student counseling services. Universities may also need to re-evaluate the availability of counseling services to meet the busy time demands of graduate students who may also work or who have families.

Students also discussed reaching out to faculty, however, they only sought support from faculty they perceived as comfortable with self-disclosure and those who displayed a genuine interest in others. It is not uncommon for individuals to develop attachment through shared experiences. The sharing of experiences and creating an environment of trust and honesty can lead to stronger bonds of attachment, satisfaction, and overall success in a given program.[120,119] A 2003 study of nursing students revealed that the impact of highly supportive faculty members resulted in a higher likelihood that a student would persist through their academic program. For faculty, the ability to develop empathic connections can promote positive growth and development in their students.[121] Further, empathic relationships tend to improve "alliances" and may even function to minimize symptoms of depression.[122] This suggests that faculty should pay more attention to their role as, not only as a content expert in their profession, but as a primary source of influence, encouragement, and empathic mentorship.

During the qualitative portion of this study, participants described leaning on faculty who had less of a hierarchical relationship with their students. This need for egalitarian leadership is not surprising for students who identify as millennials. Often

referred to as “Generation Me,” millennials are considered to be those individuals born between 1981-2004. According to current research, millennials demonstrate the desire for equality in relationships, and also have significant concerns about success and failure.[14] Research has also shown that millennials tend to have been sheltered by their parents and feel that there is a particular specialness to them, which increases confidence. They are also felt to be team-oriented, high achieving, and carry a sense of pressure to perform.[14] These tendencies may be facilitating the need for students see faculty more as equals, and to seek support from faculty who are open to minimizing the hierarchal structure of the student-faculty relationship.

This study did not evaluate the perceptions and resources available to faculty regarding their willingness or skills to support students who are experiencing stress, anxiety, and depression. It is very possible that faculty may feel conflicted about self-disclosure with students because they are often from a distinct generation. Assuming that the majority of faculty were born between 1943-1981, there may be a tendency for inherent value to be placed on independence, achievement, and paying your dues.[14] This is inconflict with the generational tendencies of current students to seek equality, lean on external sources for guidance and control, and crave structure.[14]

Some faculty may also feel ill-equipped to manage the seriousness of some mental health issues, and there is some evidence to support this concern.[4,10] However, despite feeling inadequately prepared, faculty do demonstrate a strong desire to help their students. In a recent study, 84% of polled faculty were open to gaining the knowledge needed to be better prepared.[81] Some universities have already begun implementing training such as, Mental Health First Aid[123], into their faculty development programs.

Other universities are working to develop behavior health partnerships like the one at the University of Illinois, which includes services such as tele-health, groups sessions, and home visits.[124]

Challenges of Professional Education for Students

In the book, Mental Health Issues and the University Student, Iarovici states that millennials may have a particularly difficult time transitioning to environments such as graduate school because they tend to be raised is a very structured environment.[14] This aligns with the qualitative evidence from this study that revealed a strong perception of elevated stakes, expectations, and demands with the transition to professional studies from an undergraduate program. The changes that were found to be greatest for students during this transition were the intensity of the workload, the fear of potential failure, and the weight failure carried. Struggles balancing the new academic demands with emerging adult responsibilities (including families and finances) were also noted. Much of this evidence coincides with the most current literature revealing common stressors for graduate students.[7]

An additional stress noted by the interviewees was that of balance. The vast majority of students expressed difficulty with the ability to balance new academic demands with their families, social network, religion, and self-care. Research has shown that the constant attempt at balance, defined as 'the power or means to decide,' as quoted by Chris Brus in his article, *Seeking Balance in Graduate School: A Realistic Expectation or a Dangerous Dilemma?* can create an on-going turmoil of decision-making for students.[125] As students enter graduate school, their life demands are often altered at

some point during their academic path. Marriage, parenthood, caring for a sick parent, changes in living situations, and financial burdens are all common experiences for emerging adults. According to Brus, there may be a cost associated with the continuous efforts to pay equal attention to all things demanding one's attention, and this may present in the form of guilt and distress.[125]

Another finding that may be influenced by the transition to professional education is the threat of failure. In this study, students described their fear of failure as an overwhelming perception that the risk of failure threatened their experience as a student on a daily basis. They also described the intensity of this fear as significantly higher than what they had experienced in their undergraduate programs. There are several factors that may be contributing to this perception.

First, as previously discussed, students admitted to DPT program come into the experience with a very high level of academic success, and often minimal experience with failure. According to Iarovici, this generation of students is often sheltered and over-managed by their parents[14], resulting in limited exposure to disappointment or struggle, particularly in terms of academics. It is possible that their professional program is the first-time students are exposed to high stakes testing situations or material that may require an altered method for synthesizing. The novelty of these demanding and potentially career ending situations may result in the development of excessive fear of failure, even within low stakes environments.

There are a variety of theories surrounding the exact mechanism of fear, with many scientists believing that fear is a neurobiological function of survival.[126] The

survival system works by regulating neurochemicals and hormones that stimulate the autonomic nervous system, thereby releasing cortisol throughout the body. Evidence clearly shows that the presence of cortisol, especially in a chronic, prolonged state, can be detrimental to both physiological and cognitive functions,[23] such as cardiac function, blood glucose levels, and executive roles of the frontal lobe. When considered in concordance with the Stress-Diathesis Theory (Figure 1), fear may be a trigger contributing to the onset of the depression, anxiety, and stress seen in DPT students. This is an important consideration since research also shows that mental health disorders, such as depression, can have a detrimental impact on academic performance.[23] It is possible that the excessive perception of fear experienced by DPT students may be contributing to the rise in mental health disorders seen in recent years, and that both fear and mental health challenges may have a deleterious impact on cognitive and physical health.

Social Perfectionism

The experience of DPT students, who self-identified as having a mental health disorder, was often described in terms of fear, judgment, expectations, demands, and the constant need for perfection. In addition, students described their experience in terms of assumptions regarding what others felt about mental health and how they compared themselves to others in their environment. Each of these constructs can, and often does, have a negative influence on the human experience.[125] They can also be associated with the concept of social perfectionism, which may be one of the driving forces behind the elevated depression, anxiety, and stress scores that were found during this research.

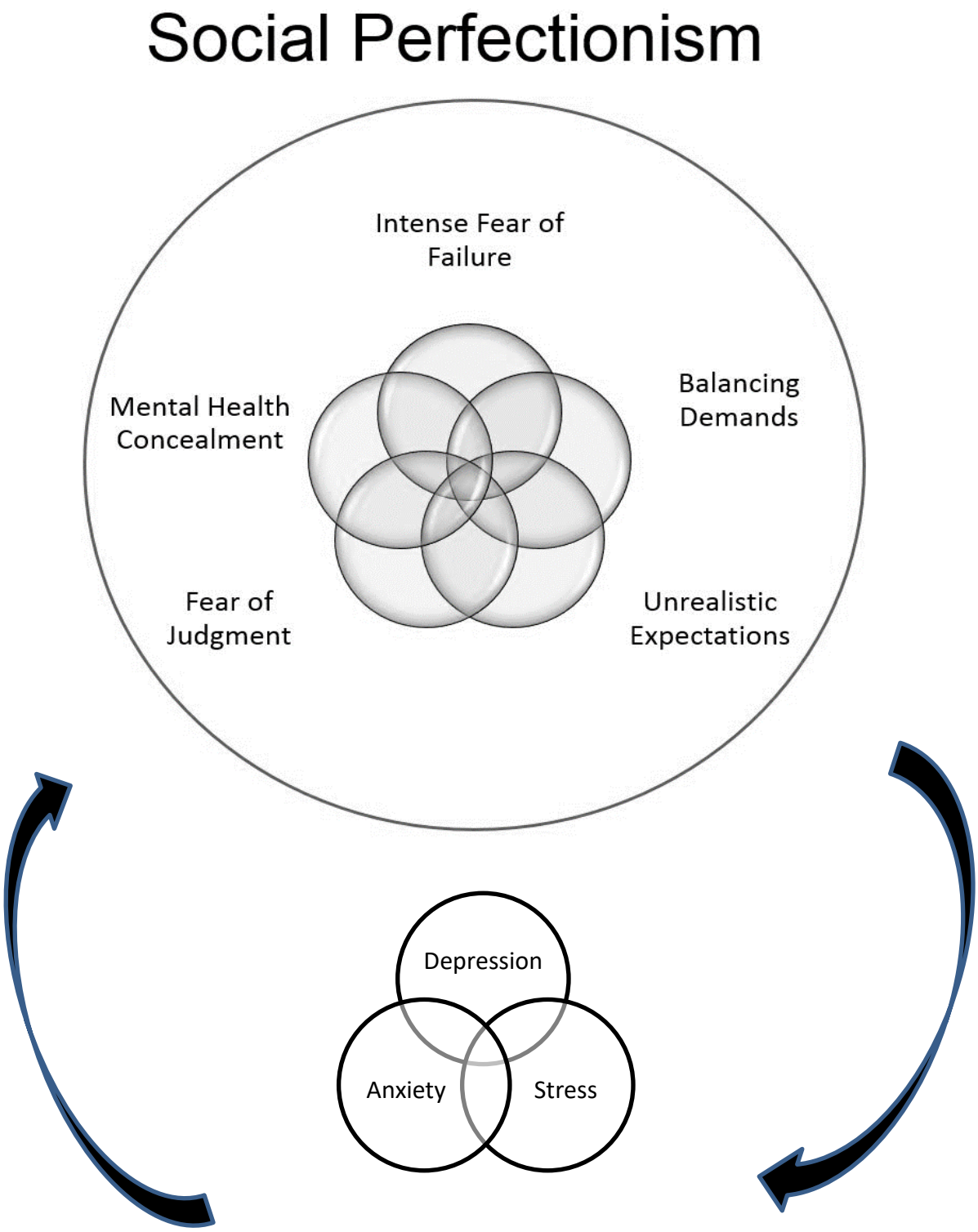
Social perfectionism, a construct developed in the early 1990's, is defined as one's perceived notion that others hold stringently high and unattainable standards for them, expecting perfection and exerting the pressure on one to achieve it.[127] This definition was written alongside the terms *individual perfectionism* and *other- oriented perfectionism*, both of which have been found to have, at least some adaptive properties.[128] These properties include things like motivation and attention to detail.[126] Christman has found s*ocially prescribed perfectionism* to have maladaptive properties, such as "performance anxiety, social anxiety, writer's block, procrastination, study inefficiency, over-committing, and obsessive compulsive characteristics.[125] Christman also states that social perfectionism can lead to issues with group projects, create higher levels of stress, and a greater fear of failure.[125]

The current study found social perfectionism to encompass 5 major concepts: *1) Intense fear of failure, 2) Balancing Demands, 3) Unrealistic Expectations, 4) Fear of judgment and 5) Mental health concealment*. Each of these concepts is a perception that the vast majority of students maintained as consistently present throughout their experience and were referenced several times throughout their interviews.

In addition, each of these concepts represented expectations that the student believed others had for them. For example, interviewed participants described the impact that failure would have on their family, the excessive expectations of the graduate faculty, or the concern of being treated differently if their mental health issues were disclosed. Although social perfectionism was not specifically studied in this project, the above provides evidence to suggest that further investigation into the impact of this social construct may be warranted.

Research demonstrates several links to negative outcomes when social perfectionism is present,[128] however, more concerning is the research that has shown a significant relationship between social perfectionism and the presence of depression and anxiety.[129] The triangulation of the developed themes and the high incidence of depression, anxiety and stress in DPT students suggests that social perfectionism may play a role in the development of these mental health disorders. As is the case with fear behavior, the stress-diathesis theory suggests that the perception of social perfection may act as the catalyst for the onset of mental health disorders. The diathesis (the predisposition) may be influenced by not only the student's genetics, but also the generational tendencies fostered by a student's up-bringing, which can be triggered by a substantial stressful event or feelings. The figure below (Figure 29) provides a visual representation of the relationship between social perfectionism and the constructs found in this research that may act as a trigger for mental health disorder expression.

Figure 29. Graphical Representation of Social Perfectionism and Related Constructs



Implications for the Profession of Physical Therapy

The implications of these findings may serve DPT students by bringing the stigmatized conversation of mental health to the forefront of academics. Students continue to feel a sense of shame and apprehension when faced with psychological disorders, and they also tend to be more sensitive to fear and adverse experiences.[14] They also fear judgment, particularly by their faculty and peers. This research works to initiate discussion at individual institutions as well as nationally, explore the impact of generational influences in academia, and encourage students to be open and honest about their challenges with mental health.

As students begin to recognize and verbalize their own mental health issues, faculty may also want to re-evaluate their capability and comfort level with assisting students when in distress or crisis. Administrators may need to assess ways in which they might be able to support their faculty members to feel better equipped for these circumstances. For example, Texas Woman's University, Dallas campus has begun providing a mental health first aide course to their faculty and students. This 1-day course allows participants to gain background knowledge and tools to utilize, specifically in higher education.[123] Efforts such as this may work to mitigate the concerns faculty have about their ability to provide appropriate assistance to students when psychological issues are impacting their academic experience.

Programs may also want to consider how they are working to support not only struggling students, but also the peers they are seeking for support. Institutions such as Northwestern University have established a program that focuses on student testimonials,

which works to provide a sense of community and connection, encouraging students to seek support through shared struggle.[130] As another example, Drexel University offers free health screens via kiosk.[130] This allows students privacy in self-assessment, yet allows follow up services to be provided based on the outcome of the survey. Florida State and Stanford have both instituted resilience training programs for their students, which are offered fully on-line to accommodate flexibility and time constraints for students.[122] There appears to be several low-cost avenues that DPT and other health science programs could consider to support the needs of their students. Given the equal rates of depression, anxiety, and stress in DPT students regardless of where they reside in the US, a national initiative through the American Physical Therapy Association and/or American Council of Academic Physical Therapy (ACAPT) is recommended. The ACAPT has already created a task force to look at this issue from an institutionalized perspective.

This data may also be useful in guiding how DPT programs plan their learning environments, especially for their 1st year students, as 1st year students are the most at risk for mental health concerns. The relationship between depression, anxiety and stress is an important consideration for the classroom, especially when bearing in mind that anxiety and stress scores in 1st year students were higher than subsequent years. The following paragraphs explore several opportunities based on this research.

Knowing the inherent risk for 1st year DPT students, considerations should be made with respect to how programs manage orientation and mentorship during their 1st semester. Special attention should be placed on the advisor/advisee relationship as a large portion of student satisfaction is connected to this bond,[29] as well as mentor-mentee

relationships with other student cohorts. In addition, faculty as instructors and advisors should also be aware of the generational preferences of their students. For most DPT students, this includes the need for open and honest communication, from faculty, in the form of self-disclosure and genuine interest in others.

One aspect that DPT programs may also need to consider is whether or not there are aspects of the educational institution's learning environment that foster some aspect of the social perfectionistic perception. Programs might consider support systems that would counteract the pressure of social perfectionism, including shared experiences of prior or more experienced students, increased advising in the first year compared to subsequent years, emphasis on learning rather than grades, and a culture of mental wellness in addition to physical wellness.

Awareness of the perfectionistic tendencies, and the constructs that influence those perceptions may be particularly useful in guiding curriculum considerations and changes. Enhanced curricula may include increasing student's self-evaluation of mental health or coping mechanisms, exposure to the physiological impacts of stress and mental health disorders, or content related to self-management of stress and anxiety. For example, DPT programs may want to consider the content within their psychosocial course and assess for areas where one or more of these topics may apply. Other DPT programs may want to assess ways that they can incorporate these concepts into areas outside of structured class time, such as brown bag lunch sessions, mindfulness practice, and opportunities for meditation and self-care.

There are also implications for the profession of physical therapy as a whole. Given the high incidence of depression, anxiety, and stress in DPT students as well as several other related majors,[8,9,11,46] there is some concern about the mental state of individuals once they become professionals and how this will impact patient care when students become licensed physical therapists.

The presence of mental health issues, stress, and fear may all negatively impact executive function needed to make critical decisions in the clinic.[22,126] This may directly impact patient care, safety, and efficacy of treatment, as well as, the empathic connection to the patient. This concern creates some impetus for DPT and other healthcare programs to consider the impact of their students' mental health on the program and the profession, and then decide what changes they may need to make to optimize the experience of the student and then the professional. The direct impact of mental illness on compassion and patient care is an area that would greatly benefit from on-going research.

Suggestions for Future Research

Further research is needed to evaluate the factors influencing depression, anxiety, and stress in DPT students. Additional qualitative research studies regarding the experience of DPT students across the curriculum are warranted to develop a longitudinal perspective of the strategies student use to combat stress, anxiety, and depression across the curriculum. Exploration of the current patterns of self-management and strategies would be beneficial in helping to guide DPT programs in program development to support mental health.

Perhaps more importantly, research is needed regarding the efficacy of strategies to enhance DPT student mental health at the institutional, classroom, and individual level. Given the similarity of this research with prior studies with other healthcare professionals such as nursing, medicine, and pharmacy, inter-professional research regarding such strategies could be very powerful. Such research could lead to collaborative efforts to change how we manage and teach students in the health professions. These collaborations may lead to additional research on innovative ways to support students' needs such as utilization of technology, distance support mechanisms, social media usage, and customized programs that are accessible at all hours. Further assessment of their effectiveness, most appropriate timing for introduction, and their impact on the student as a professional would be greatly valued as programs work to meet the ever-changing needs of their students. The impact of faculty and administrator training on students' perceptions of university support may also be warranted based on the qualitative findings of this study.

It would also be beneficial to evaluate the incidence of depression, anxiety, and stress in the first year of practice or early career development. Based on the number of participants who did not complete the 42-item DASS, we suggest the use of the shorter DASS-21 survey to increase response rate.

Finally, studies that evaluate the impact of mental health of the professional on aspects of patient care would help all care-giving health professions better recognize and understand the importance of mental wellness. Advancements on previous studies focusing on compassion and empathy to include the mental health variable would assist educational institutions to better incorporate mental wellness strategies with the goal of

preparing the student as both an individual and a professional prior to their entrance into their given field.

Limitations and Delimitations

Limitations of Quantitative Study

There were several anticipated limitations to this research study. The first was the potential for limited survey response rate. The original estimated sample required for statistical significance between groups was just over 2000 responses. Once response rate reached over 700 responses, the data underwent a preliminary analysis, and significance was found at $\alpha=.05$. Since statistically significant findings were present at less than half of the estimated requirement, it was determined that data would not require the original, conservative estimated sample size.

Response rate may have also been limited the distribution method. This refers to the demographic and DASS-42 survey which was distributed via email. Since students were asked to participate by their department chairs, directors, or DCE's, response rate relied upon their agreement to distribute the email survey. There was also no way to track which institutions participated, which was intentional to protect the privacy of the students. Student participation may have also been self-limiting, in that even if they received the request, students may have felt too busy to participate, potentially limiting the number of responses.

Response rate may have also been limited by fear of disclosure or confidentiality. Because the questions being asked were of a sensitive nature, it is reasonable that some students may have felt hesitant to participate. In addition, surveys are always vulnerable

to response bias as some individuals may not want to answer truthfully or may feel they are expected to answer a certain way. Every attempt to minimize this was made by clearly instructing the students to provide honest answers with reassurance of complete confidentiality. Anonymity was maintained entirely unless the student agreed to be interviewed. The student was only required to provide an email address as a point of contact and was not identified in any portion of the data report.

The timing for distribution may have also impacted the response rate. Since programs do not have uniformity in their clinical education and other academic requirements, some students may have been on clinical rotations or not on campus, thereby limiting their desire to participate. This limitation was minor since the survey was via email, however, the introduction may be altered if the students were not on campus at the time of distribution.

Once the data was cleaned, there were 34 surveys that were not included in the analysis secondary to incomplete data. All 34 with incomplete information had stopped at the same question, which happened to be the last one on the electronic page. In order to get the final questions, participants needed to click "next." It is assumed that these participants thought that the survey had ended, despite the instructions indicating how many questions were included in the survey. This oversight may have been secondary to survey fatigue, or may have been a genuine error in completion. It is possible that highlighting that information in the instructions may eliminate this as an issue in future studies.

Interpretation of the survey questions may have led to inaccurate answers. This is an inherent risk of any survey research project, particularly those that use scales with words such as "somewhat" or "sometimes." These types of phrases can mean different things to different people depending on their background and previous history. This was minimized by ensuring that there were clear expectations and directions for both quantitative surveys that were written using basic language to improve understanding.

When reviewing the questions following the results, it was discovered that one of the limitations was in the wording and available choices of the questions. In the mental health history questions that asked participants to select those disorders that they have had experience with, the survey only allowed for a single choice. This likely led to an underrepresentation of the mental health history data, as the final data analysis clearly demonstrated overlap between anxiety, stress, and depression. Only having the ability to choose a single disorder definitely limited those overall results. Future survey designs should allow for multiple options, or a rank ordering of disorders in order to capture the full data set.

Limitations of Qualitative Study

Phone interviews may have presented an answer bias limitation as well. Despite the fact that the interviews were voluntary, students may have felt pressured to respond in a certain manner or may have felt that they needed to minimize their feelings. In addition, since some of the discussion was around faculty involvement, students may have felt concerned about repercussions. This was minimized by de-identifying the University of Record and by asking the student to refrain from using any names or

identifying information in his/her answers. In addition, there was the potential for biasing in the voluntary basis of the interviews as those who volunteered may have been more likely to have stronger feelings about mental health than students who did not volunteer to share.

Inherent of qualitative research was also the risk of bias in interpretation. The interview process, coding, and data analysis was conducted primarily by the lead investigator, however was also available to the research committee for discussion, consensus of ideas, and rigor. The use of one interviewer and coder helped to minimize conflicting biases, while the oversight of the committee helped to guide consensus and clarity to the data analysis.

In general, the resources required to carry out both the quantitative and qualitative portions of this study were minimal. This study required access to contact information for all DPT programs, which is public information. The quantitative portion of the study was carried out by phone, with no concurrent charges or fees. The use of the quantitative scale, the DASS-42 was available for public access, and required no fees or special permission for use, and the survey tool, PsychData was available for this study free of charge. The only costly items are the DASS-42 manual, which was essential for appropriate decision-making regarding statistical analysis, and the option for interview incentives. These resources were covered by a small grant opportunity offered by Texas Woman's University.

Conclusion

Mental health concerns have been rising over the past 25 years, and recently, these concerns have begun to emerge as more serious than ever before. Graduate students are particularly vulnerable to mental illness secondary to a variety of factors including finances, adult responsibilities, generational tendencies, and increasingly intensified academic load. Because of the lack of research in graduate programs and specifically with DPT students, this study sought to investigate the incidence of mental health and lived experience of DPT students who were experiencing mental illness and navigating the rigors of DPT school.

DPT students demonstrated higher levels of depression, stress, and anxiety than their peers, and this may be due to several extrinsic and intrinsic factors. In addition, 1st year students were more likely to experience higher levels, possibly due to the impact of transition from undergraduate to graduate school. In addition, the high levels of mental illness may also be influenced by an intense sense of fear of failure, which may be precipitated by the perception of social perfectionism.

When seeking support for these issues, students most often turn to friends or family, however they also seek out faculty who are willing to be honest about their own struggles and who also demonstrate a genuine interest in the student. Despite feeling a lack of preparation when dealing with a student who is struggling, the majority of faculty are open to developing in a way that supports and provides for the student. University programs can support their faculty and students by making efforts to provide training and resources that provide tools and coping strategies.

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Appendices

Appendix A

Demographics and History Survey

Please respond to the following questions:

1. How old are you?
    a. Up to 19
    b. 20-25
    c. 26-35
    d. 35-40
    e. 41-45
    f. 46 or older

2. Are you
    a. Male
    b. Female

3. What race/ethnicity best describes you?
    a. American Indian/Alaskan Native
    b. Hispanic/Latino
    c. Asian
    d. African American/Black (non-Hispanic)
    e. Hawaiian/Pacific Islander
    f. White (not of Hispanic origin)
    g. Other

4. I am an international student who is studying under a VISA?
    a. Yes
    b. No

5. If you answered "yes" to question number 4, please write in what country you are a citizen of?
    _____.

6. Please choose the area of the country that best represents where you live?

    a. Northeast
    b. Southeast
    c. Northwest
    d. Southwest

7. I am currently in my _____ year of my DPT program
    a. 1st
    b. 2nd
    c. 3rd
    d. I have been in my DPT program more than 3 years

8. Please choose the range that *best* describes your current GPA?
    a. 4.0-3.5
    b. 3.4-3.0
    c. Below 3.0

9. Have you ever been DIAGNOSED with any of the following disorders?
    a. Depression
    b. Anxiety
    c. Post-traumatic stress disorder
    d. Bipolar Disorder
    e. Schizophrenia
    f. Other

10. Do you have any family history of mental health disorders? (If yes, please check all that apply)
    a. Yes
        i. Depression
        ii. Anxiety
        iii. Post -traumatic stress disorder
        iv. Bipolar Disorder
        v. Schizophrenia
        vi. Other
        vii. I don't know

    b. No

11. Do you think you may have any of the following disorders, but have not been diagnosed?
    a. Depression
    b. Anxiety
    c. Post-traumatic stress disorder
    d. Bipolar Disorder
    e. Schizophrenia
    f. Other

12. Do you currently take any medications to manage a mental health disorder (includes stress disorder, anxiety disorder, depression etc.)
    a. Yes
    b. No

13. Do you have a history of trauma in your past (this includes but is not limited to sudden death of a loved one, rape, abuse, abandonment, war etc.)
    a. Yes
    b. No

14. Do you suffer from any chronic disease?
    a. Yes
    b. No

15. Do you have a history of drug and/or alcohol abuse (use of illegal substances or excessive alcohol intake or binge drinking)?
    a. Yes
    b. No

Appendix B

DASS-42

I found myself getting upset by quite trivial things	**0**	**1**	**2**	**3**
2. I was aware of dryness of my mouth	**0**	**1**	**2**	**3**
3. I couldn't seem to experience any positive feeling at all	**0**	**1**	**2**	**3**
4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	**0**	**1**	**2**	**3**
5. I just couldn't seem to get going	**0**	**1**	**2**	**3**
6. I tended to over-react to situations	**0**	**1**	**2**	**3**
7. I had a feeling of shakiness (eg, legs going to give way)	**0**	**1**	**2**	**3**
8. I found it difficult to relax	**0**	**1**	**2**	**3**
9. I found myself in situations that made me so anxious I was most relieved when they ended	**0**	**1**	**2**	**3**
10. I felt that I had nothing to look forward to	**0**	**1**	**2**	**3**
11. I found myself getting upset rather easily	**0**	**1**	**2**	**3**
12. I felt that I was using a lot of nervous energy	**0**	**1**	**2**	**3**
13. I felt sad and depressed	**0**	**1**	**2**	**3**
14. I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting)	**0**	**1**	**2**	**3**

15. I had a feeling of faintness	**0**	**1**	**2**	**3**
16. I felt that I had lost interest in just about everything	**0**	**1**	**2**	**3**
17. I felt I wasn't worth much as a person	**0**	**1**	**2**	**3**
18. I felt that I was rather touchy	**0**	**1**	**2**	**3**
19. I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	**0**	**1**	**2**	**3**
20. I felt scared without any good reason	**0**	**1**	**2**	**3**
21. I felt that life wasn't worthwhile	**0**	**1**	**2**	**3**
22. I found it hard to wind down	**0**	**1**	**2**	**3**
23. I had difficulty in swallowing	**0**	**1**	**2**	**3**
24. I couldn't seem to get any enjoyment out of the things I did	**0**	**1**	**2**	**3**
25. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	**0**	**1**	**2**	**3**
26. I felt down-hearted and blue	**0**	**1**	**2**	**3**
27. I found that I was very irritable	**0**	**1**	**2**	**3**
28. I felt I was close to panic	**0**	**1**	**2**	**3**
29. I found it hard to calm down after something upset me	**0**	**1**	**2**	**3**
30. I feared that I would be "thrown" by some trivial but unfamiliar task	**0**	**1**	**2**	**3**

31. I was unable to become enthusiastic about anything	**0**	**1**	**2**	**3**
32. I found it difficult to tolerate interruptions to what I was doing	**0**	**1**	**2**	**3**
33. I was in a state of nervous tension	**0**	**1**	**2**	**3**
34. I felt I was pretty worthless	**0**	**1**	**2**	**3**
34. I was intolerant of anything that kept me from getting on with what I was doing	**0**	**1**	**2**	**3**
36. I felt terrified	**0**	**1**	**2**	**3**
37. I could see nothing in the future to be hopeful about	**0**	**1**	**2**	**3**
38. I felt that life was meaningless	**0**	**1**	**2**	**3**
39. I found myself getting agitated	**0**	**1**	**2**	**3**
40. I was worried about situations in which I might panic and make a fool of myself	**0**	**1**	**2**	**3**
41. I experienced trembling (eg, in the hands)	**0**	**1**	**2**	**3**
42. I found it difficult to work up the initiative to do things	**0**	**1**	**2**	**3**

Scoring:

Download the DASS 42 PDF file and the Scoring Template PDF file.

A **sum** of the scores for each of the seven questions completed by each participant, in each of the sub-scales, are then evaluated as per the severity-rating index below.

	Depression	**Anxiety**	**Stress**
Normal	0 – 9	0 - 7	0 – 14
Mild	10 – 13	8 – 9	15 – 18
Moderate	14 – 20	10 – 14	19 – 25
Severe	21 – 27	15 – 19	26 – 33
Extremely Severe	28+	20+	34 +

Norms: Normative data are available on a number of samples. From a sample of 2914 adults the means (and standard deviations) were 6.34 (6.97), 4.7 (4.91), and 10.11 (7.91) for the depression, anxiety, and stress scales, respectively. A clinical sample reported means (and standard deviations) of 10.65 (9.3), 10.90 (8.12), and 21.1 (11.15) for the three measures.

Appendix C – Grant Award Letter/Email

Dr. Bogardus,

I am pleased to inform you that your 2017-2018 Small Grants Request in the amount of $460 has been approved to pay for the DASS-42 Handbook and research participant incentives. I am copying Madhura Maiya on this email and you can communicate with her about ordering the handbook. Regarding the gift cards, please let me know what type of gift card you need and the status of your IRB. I have 20 Target gift cards that were left over from a previous study that I would like to assign to you if they will work. In order to receive the gift cards, you will need to complete the attached gift card certification form. I have included some of the information but need you to complete the title of the study, the IRB protocol #, and the estimated completion date. Once I have this signed form, I will get the gift cards to you.

Any publication or presentation resulting from these funds shall include the following acknowledgment, “Supported by Texas Woman's University Small Grant Program" and will be posted in the Pioneer Open Access Repository at https://poar.twu.edu/. In the Fall 2018, Research & Sponsored Programs will request a brief report on these funds, including how these funds supported/enhanced your research efforts and contributed towards a proposal for external funding.

Again, congratulations on your award and please let me know if you have any questions.

Ms. Tracy Lindsay, Director of Operations

TWU Office of Research & Sponsored Programs

PO Box 425619 Denton, TX 76204

Phone: 940 898-3377

ACT 7th Floor

Appendix D – Interview Guide

Jennifer Bogardus (Interviewer)

Research Questions:

3. What support systems and/or resources do DPT students rely upon when experiencing mental health issues?
4. What are the perceptions and beliefs of DPT students regarding their faculty advisor's role in responding to and managing mental health issues?

INTERVIEW QUESTIONS

Neutral Opening Question:

-What types of challenges have been most prevalent for you as a DPT student?

Probing Questions:

- What types of mental health issues have you experienced during your time in your DPT program?
- Describe your experience as a DPT student with stress, anxiety, or depression (What has this experience been like for you as a graduate student with mental health issues?)
- How has the experience of stress, anxiety, or depression impacted your academics? Your personal life? Your quality of life?

Central Question #1:

- Describe the support systems or resources that you have felt most comfortable utilizing to manage the stress, anxiety or depression.

    - Probing Questions:
      -Describe what resources have been the most meaningful/helpful.
      -In what ways has this resource (or resources) been helpful?
      -Explain why you chose this resource (or resources) over other options.
      -Tell me about barriers you have encountered in accessing resources
      -Explain how you utilize the resources (ex: for verbal support, academic assistance, psychological treatment etc.)

Central Question #2:

- Describe how you view the role of faculty with respect to students who are experiencing mental health issues.

    - Probing Questions:

      -How would you define the role of the faculty member with whom you have the highest level of comfort sharing personal information?

        (What is their role in your academic journey? Advisor, instructor, clinical education, Program Director etc.).

      -Explain how this faculty member has interacted with you in terms of anxiety, stress, or depression issues.

      -Describe how this faculty member has influenced your experience as a DPT student (on an academic or personal level).

      -If you do not have a strong sense of comfort with any particular faculty member, explain why you feel this way.

      -What could a particular faculty member do to improve the relationship?

Neutral Closing Question:

-What else you would like to share about your experience with mental health issues?

-What else you would like to share about your experience with the resources available to you during your time as a DPT student?